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# The IRON AGE

OCTOBER 5, 1944

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## INLAND STEEL

*Producing for Victory...*

*...Preparing for Peace*

COMPLETE STORY ON PAGE 50

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*THE IRON AGE*, published every Thursday by the *CHILTON CO. (INC.)* Entered as second class matter November 3, 1932, at the Post Office at Philadelphia under act of March 3, 1879. $8 yearly in North America and South America. Foreign $15. Vol. 154, No. 14.

J. H. VAN DEVENTER
*President and Editorial Director*

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Editorial and Advertising Offices
100 East 42nd St., New York 17, N.Y., U.S.A.

O. L. Johnson, Market Research Mgr.
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R. E. Baur, Typography and Layout

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Indexed in the Industrial Arts Index. Published every Thursday. Subscription Price North America, South America and U. S. Possessions, $8; Foreign, $15 a year. Single Copy, 35 cents.

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Cable Address, "Ironage N. Y."

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Vol. 154, No. 14 — October 5, 1944

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# Ryerson Explains New Alloy Plan at Metal Show

## All steps for providing hardenability data will be demonstrated

***NATIONAL METAL CONGRESS • CLEVELAND • OCTOBER 16-20 • BOOTH 141-B***

In Booth 141-B at the National Metal Congress, Ryerson plans to conduct Jominy End-Quench Hardenability Tests and to explain how hardenability results can be interpreted in terms of physical properties for quenched and drawn alloy bars of various sizes. If you attend the show, don't miss this unique Ryerson display.

Ryerson has always exercised close control over alloy steel quality, and for a number of years has furnished the chemical analysis and heat treatment response data with each alloy shipment. Now, this service has been extended under the Certified Steel Plan to give new added hardenability information, which makes Ryerson service even more helpful than before.

A new type of report, containing both hardenability and analysis data, now is being sent with each Ryerson alloy steel shipment. In addition to the chemical analysis, every heat of alloy destined for Ryerson stocks is subjected to a series of end-quench tests. The results of these tests are interpreted through tables of known physical relationships to reveal obtainable tensile strength, yield point, elongation, and reduction of area for bars up to 4 inches in diameter, that have been quenched and drawn at 1000°, 1100° and 1200° F. The Ryerson Alloy Steel Report includes all this test data plus a recommendation of working temperatures.

Whether you order a single bar or many tons, you are assured of a report covering all alloys shipped. All Ryerson alloys are identified with color markings according to type of steel. Large bars are individually stamped, smaller bars are bundled and tagged with an unmistakable heat symbol. The identification is cross referenced between steel and report sheet so that any steel can be quickly verified.

Investigate! Make sure you are getting this important help.

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# The British View Lend-Lease

*(Cabled from London)*

BRITISH steel workers are complaining that heavy importations of American semi-finished steel under lend-lease arrangements are continuing at a time when the steel rate of the United Kingdom is dropping. Concomitant with an easing manpower situation, this complaint is understandable.

I can well imagine a similar objection being even more loudly registered by our American steel workers if the situation were reversed, and if in the face of a declining labor market at home, several hundred thousand tons of steel a month were coming into the United States from abroad.

This lend-lease business, after the war, is likely to become an international hot potato unless it is realistically approached and viewed solely as a war measure and not a postwar practicality.

If "in kind" payments were made for practically all lend-lease exports to our Allies except, of course, the specialized munitions and war equipment not applicable to normal trade, the same objections would arise as would our postwar receipt of steel imports.

The continuance of the importation of semi-finished steel in Britain was and is a war measure although it has not so been realized by the steel workers. British railways have been called upon to do a tremendous job since the June 6 invasion due, in the main, to the requirements of troop movement and supply. And from the transportation standpoint, the importation of a ton of semi-finished steel saves the domestic hauling of at least two tons of ore, limestone and coal.

England, unlike America, normally must depend upon imports and exports. Now, after five years of a completely dislocated trade economy, that country is in the position of a shopkeeper who has for a long time been cut off from both suppliers and paying customers. Her shelves are bare and the cash register has ceased ringing. Although we look forward to doing a profitable business with the British Empire after the war, it must be kept in mind that England will be in no position to become a regular customer, nor a supplier, until it regains its own customers.

Under the terms of lend-lease, Great Britain is prohibited from using American steel and other goods for developing exports. In the face of an impending easing of war manpower, it is inevitable that the British will seek a postwar clarification of lend-lease, and from the standpoint of mutual interests, both of postwar trade and security, we should seek it also.

# INLAND STEEL
# for Victory and for Peace

Inland metallurgists and steelmakers are developing new steels and improved processing methods that are helping to speed the day of Victory. These developments, and those that are to come, will assure the finer and more durable products for America at Peace . . . and remember Inland specialists are ready to help you with problems of selection, design or fabrication. The following is a summary of Inland products for your convenience.

## Cold Rolled Sheets and Strip

Inland rolls a wide range of high quality cold rolled sheets and strip for many manufacturing purposes. The characteristics are varied to meet the exacting requirements of every product and method of fabrication including forming, deep drawing, spinning, etc.

## Hot Rolled Sheets and Strip

Many notable advancements in metallurgical control, processing and finishing operations have been pioneered by Inland—resulting in hot rolled sheets and strip that are unsurpassed for workability and finish.

## Galvanized Sheets

Inland offers many types of galvanized sheets for roofing, siding, and many manufactured products—some are made for moderate drawing and bending, and Paint-Tite sheets with specially treated surface for superior adherence of paint.

## Tin Mill Products

Inland produces tin plate by both the hot dip and electrolytic methods. Coatings are uniform and lustrous, suitable for containers and many other products. Inland also produces manufacturing terne plate, and tin mill black plate in various finishes.

## 4-Way Floor Plate

The exclusive design of Inland Safety Floor Plate assures 4-way traction, 4-way drainage and sweeping, and 4-way matching. It has the structural strength and wearing qualities of rolled steel. It naturally forms a very good floor because it is safe and cannot burn, warp, splinter, or absorb moisture or odors.

## Plates, Shapes and Bars

Inland produces plates and shapes to all standard specifications in a wide range of sizes and weights and bars in hot rolled carbon, carbon spring steel, and silico-manganese spring steel qualities.

## Steel Sheet Piling

The nine different piling sections rolled by Inland meet practically all construction requirements. This piling is rolled from an especially tough steel with tensile strength in excess of 70,000 lbs. The Inland interlock permits free driving, yet remains watertight.

## Hi-Bond Reinforcing Bars

Hi-Bond Bars made by Inland represent the first real improvement in the bonding value of reinforcing bars in more than 30 years. The scientific design of this new Inland Hi-Bond concrete reinforcing bar, with its reversed double helical ribs, provides vastly greater anchorage and bonding strength. Hi-Bond Bars are made in nine standard areas.

## Rail and Track Accessories

Inland rolls standard rail sections ranging from 80 lbs. ASCE to 131 lbs. R.E. For the past nine years including the heavy wartime traffic, no transverse fissure has been found by laboratory examination in rail which has been control cooled by Inland. Joint bars, tie plates, track bolts and spikes complete the railroad service.

### Special Steels for Special Purposes

Inland manufactures Hi-Steel—the low alloy, high-strength, corrosion and abrasion resistant steel that saves weight without sacrificing strength.

Ledloy—the lead bearing, faster machining steel—is another Inland alloy. It increases output up to 110% and lengthens tool life up to 300%.

***Write for Inland Steel Products Book No. 7***

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The IRON AGE

October 3, 1944

# NEWS FRONT

► Washington and New York reporters left the recent press conference of the Automotive Council for War Production with little knowledge of how the automotive industry will reconvert and with the definite impression that the automotive people themselves had too little knowledge of their own needs to make any recommendations to Washington.

► Some critical sizes in shells have been flown to Europe in the last month to meet battlefield needs.

► Recent research in centrifugal castings have resulted in the development of steel castings having a tensile strength of 180,000 lb. per sq. in. and a ductility of about 10 per cent.

► A new anodic coating for magnesium alloys has been developed for which superiority is claimed to finishes produced by the acid dichromate and chrome pickle treatment in its high resistance to both corrosion and abrasion and in that it may be produced by either alternating or direct current.

► Postwar planners, private and governmental, look for housing to be a major work producer, with some 1,000,000 units constructed yearly for the ten postwar years.

Prefabricated or pre-cut wooden houses of standard architectural appearance may account for as much as 20 per cent of this total. The purchase of Gunnison Housing Corp. by U. S. Steel Corp. does not indicate a revival of all-steel prefabrication.

► In England, the government plans to erect some 100,000 temporary housing units each year for three years. These units, the so-called Portal house, will be all-steel, with components turned out by various pressed steel companies. A permanent all-steel unit, the Weir house, also is being considered.

The Portal house will absorb about 400,000 tons of sheets per year, over twice the pre-war consumption of sheets by the British automobile industry.

► Studies made by a prominent research organization indicate that the average industrial worker has invested $250 in war bonds during the past three years.

► Big business, which in general fretted under Government rules and regulations ever since war started, is pressing for continuance of WPB production controls during the reconversion period.

WPB, however, intends to completely discard the controls on any particular material just as soon as production exceeds war demands. This plan probably will not be altered.

► Machine tool producers, worried about the 500,000 surplus built up during the war, are somewhat startled by England's suggestion that Lend-Lease shipments be returned in conformity with Lend-Lease provisions. Officials are working on plans so that this will not occur.

► The British Government expects that after the war there will be large and urgent demands from devastated Europe for machinery and machine tools of all descriptions.

And: A plan is being formulated so that home manufacturers will first be re-equipped with new and modern equipment, during which period the older equipment would be exported, provided it was in workable condition.

► RFC is now ready to issue brochures on each of its war plants, setting forth full description of buildings, facilities, and equipment. Buyers can indicate interest and make arrangements for purchase, so that immediate occupancy can follow cessation of war work.

Plans are also well developed enabling private plants to indicate desire to purchase all or any portion of RFC equipment in their plants, with associated arrangements made to move undesired equipment into temporary RFC warehouses just as soon as war work stops.

► Aluminum scrap, currently a drug on the market, has recently been sold at less than $2 a ton.

► U. S. aerial bombs in Burma are being equipped with nose spikes so that they will stick into roadbeds and bridges rather than ricochet.

# High-Strength Centrifugal Castings

By STANLEY P. PERRY
*Research Metallurgist, North American Aviation Co., Los Angeles*

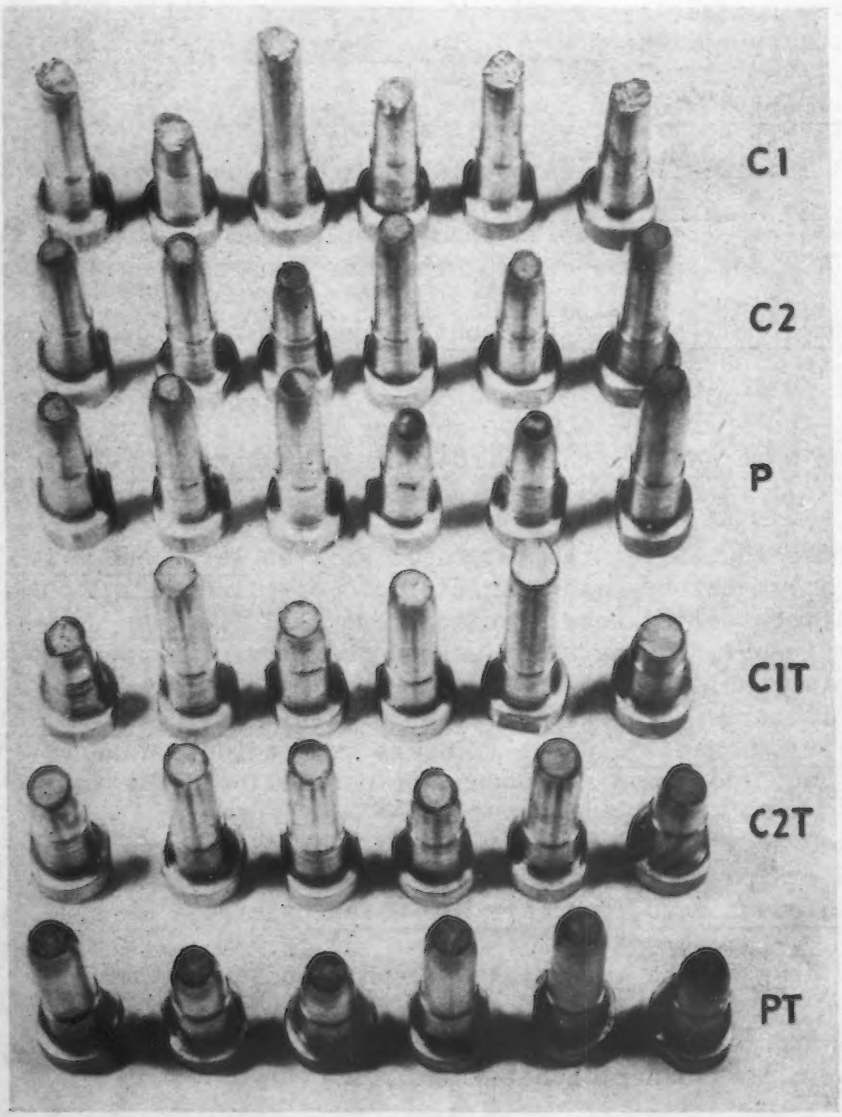
***. . . A brief description of some recent research resulting in centrifugally cast steels having strengths on the order of 180,000 lb. per sq. in., and a ductility of 10 per cent. The author was recently assistant metallurgist of Cleveland Pneumatic Tool Co.***

THE quest for castings with physical properties equal to those of wrought or forged stock has been a long and eagerly sought goal. Today, metallurgists see that task near attainment in the latest developments in centrifugal castings. Steel castings are being made having a tensile strength of 180,000 lb. per sq. in. and a ductility of about 10 per cent.

The centrifugal castings in this research were cast in a vertically rotating iron mold. They were of a tubular shape, measuring 6¾ in. O.D., 1 in. wall and 7⅝ in. in length. The chemical analysis of these castings was similar to AISI 4135 and 4140. In order to compare the physical properties of these castings, a pierced tubing of the regular 4140 was selected. All three pieces were normalized, hardened and tempered together. Table I shows the physical properties from specimens taken from each piece of tubing. These pieces were oil quenched and heat treated to a tensile strength of 180,000 to 200,000 lb. per sq. in.

Table I shows the success achieved in this centrifugal casting of steel. Sample No. 2, particularly, is equal in every respect, except for a slightly small ductility, to the pierced tubing.

FIG. 1—Tensile specimens of centrifugally cast steel and of pierced tubing. Investigation No. 2. C = centrifugally cast steel; P = pierced steel tubing. The upper three rows are normalized and the lower three rows are hardened.




*For other articles on centrifugal casting, see* THE IRON AGE, *April 22, 1943, p. 51; April 1, 1943, p. 52; May 13, 1943; May 20, 1943, pp. 53-64; Oct. 14, 1943, p. 98; Dec. 2, 1943, p. 54; Jan. 6, 1944, p. 110; Jan. 13, 1944, p. 56.*

The author has previously had occasion to test centrifugal castings, but while these castings could be heat treated to a tensile strength of 180,000 lb. per sq. in. they did not have a requisite ductility and the tensile fractures were of a cast type. Samples Nos. 1 and 2, in this investigation, showed fractures of ductile materials. Thus, the problem of ductility is pretty well solved.

Aerol shock struts for the landing gear of airplanes require steel able to withstand very high shock stresses. The centrifugal castings manufacturers are striving to make these struts from their product. Heretofore and at present, these aerols are made from forgings and pierced tubing. To date there is one problem which the makers of centrifugal castings must solve, that is the production of tubular castings from 1 to 4 ft. long.

From Table I it may be seen that sample No. 1 did not quite come up to the physical properties of heat treatment. This sample had a lower carbon and manganese (4135) as compared to the other two, which were of 4140 steel. Thus, being heat treated

together, the lower physicals of the former are understandable.

It is not intended to cover all the data being developed by this research, which is going apace. However, several more pertinent facts may be mentioned. The microscopic study of the centrifugal castings indicated an even dispersion of constituents, no segregations and a greater density of material as the outer diameter is approached. The microstudy indicated an even dispersion and a structure of tempered martensite.

These samples were produced in a laboratory foundry set up. They definitely are successful and indicate encouraging progress in centrifugal casting for aircraft applications. As a typical example, aerol shock struts, wherein centrifugal castings could well be used, require a cylinder with many bosses, lugs and flanges. Should such shapes be centrifugally cast successfully, the laborious boring of forgings would be eliminated, not to mention the making of dies and a variety of machining and welding operations. There are many other applications where castings of this quality could fill a long felt need.

The castings for this research were furnished by American Steel Foundries, Chicago; and the research was carried out by Cleveland Pneumatic Tool Co. under the direction of George N. Barrett, Jr., chief metallurgist.

RIGHT

FIG. 3—Impact (left) specimens of centrifugally cast steel and of pierced steel tubing. Investigation No. 2. Normalized samples at the left, and hardened samples at the right.

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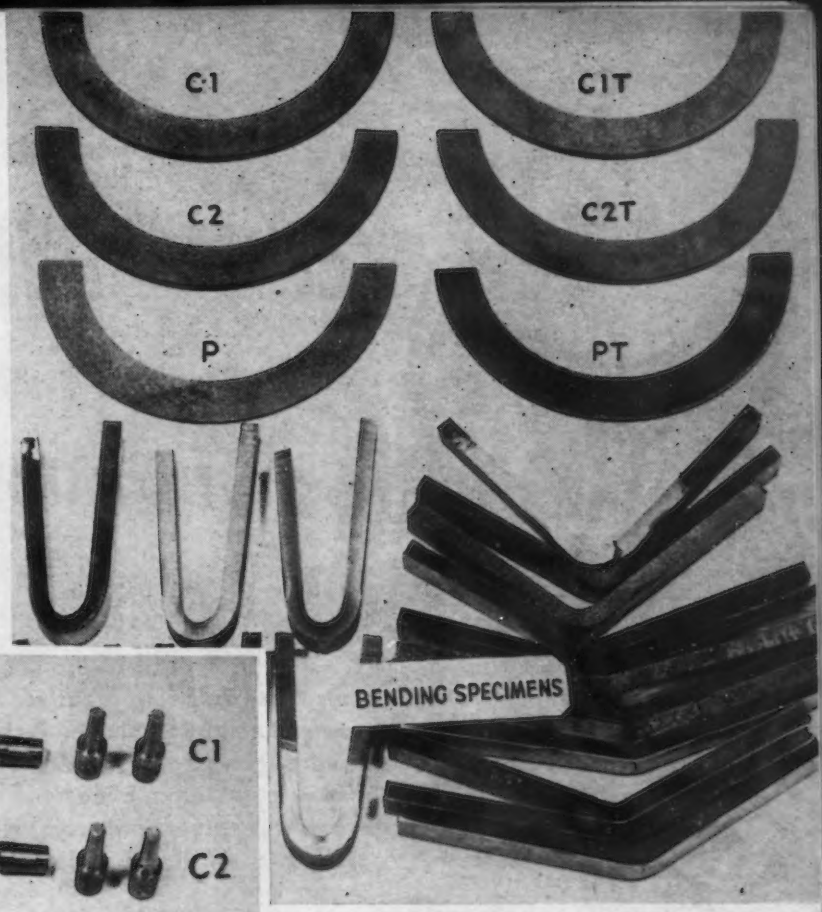
BELOW

FIG. 3—Impact (left) and fatigue (right) specimens of centrifugally cast steel and of pierced steel tubing. Investigation No. 2. C = centrifugally cast; P = pierced tubing.



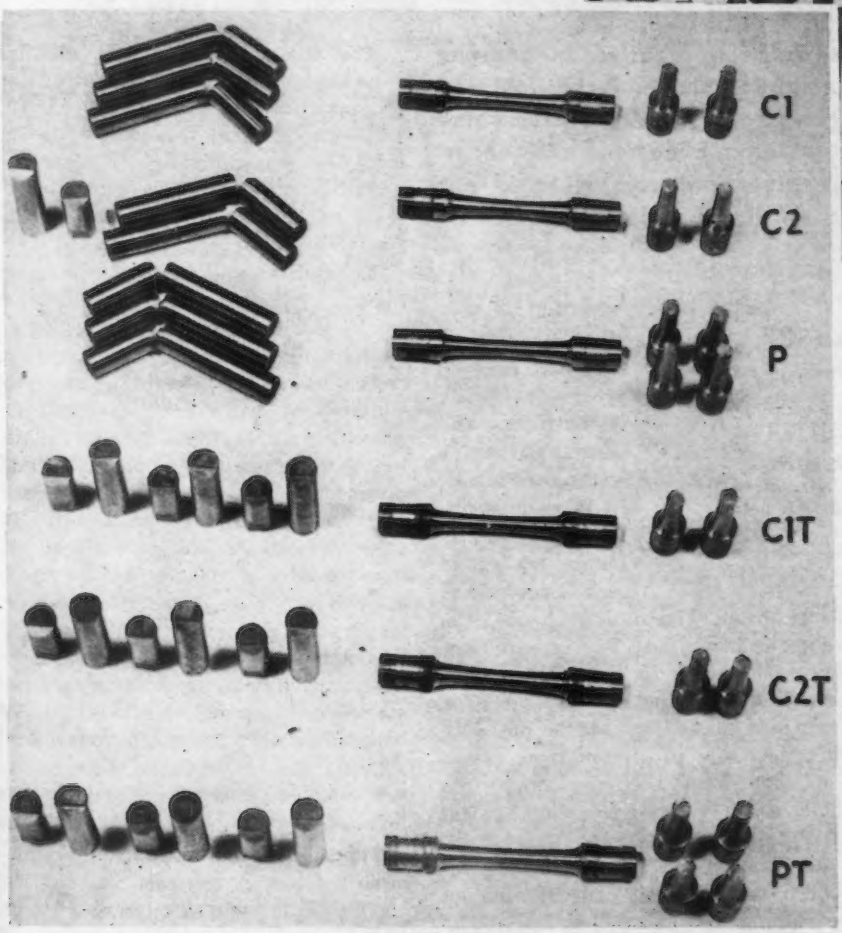




TABLE I

Comparison of the Mechanical Properties of Centrifugally Cast and Wrought Pierced Steel Tubing

*(Heat treated to 180,000 to 200,000 lb. per sq. in. tensile strength.)*

| Type of Steel | Heat Treatment | Tensile Strength, Lb. Per Sq. In. | Yield Strength, Lb. Per Sq. In. | Elongation, Per Cent in 2 In. | Reduction of Area, Per Cent | Impact Strength, Notched Izod[1] Ft-Lb. | Fatigue Strength[2] as Per Cent of Tensile | Bending Angle at Point of Rupture ½ In. Thick ¾ In. Wide | Hardness Rockwell, C Scale |
|---|---|---|---|---|---|---|---|---|---|
| No. 1 Centrifugal Casting AISI 4135 | OIL QUENCHED AND DRAWN TOGETHER | 162,250 | 145,000 | 7.0 | 20.3 | 9 | 40 | 40 | 36 |
| | | 165,000 | 148,100 | 11.5 | 36.7 | 10 | | 30 | |
| | | 162,250 | 145,200 | 11.0 | 41.0 | 9 | | 25 | |
| No. 2 Centrifugal Casting AISI 4140 | | 195,500 | 178,000 | 10.5 | 36.7 | 10 | 40 | 30 | 42 |
| | | 196,500 | 178,400 | 12.5 | 37.4 | 10 | | 30 | |
| | | 196,000 | 178,000 | 11.5 | 37.1 | 9 | | 30 | |
| No. 3 Wrought Pierced Tubing AISI 4140 | | 185,550 | 168,100 | 14.0 | 51.9 | 16 | 40 | 45 | 42 |
| | | 185,000 | 167,700 | 13.5 | 51.9 | 14 | | 35 | |
| | | 186,500 | 169,000 | 14.5 | 50.8 | 13 | | 40 | |

[1] Standard round notched Izod.
[2] Moore fatigue machines.

# A Surface Finish For Magnesium Alloys

***. . . This finishing process comes close to being ideal for magnesium alloys. Two coats of paint are sufficient for proper insulation, and high resistance to corrosion and abrasion and the decorative value of the finish could well have many postwar applications. The chemicals used are inexpensive, and the electrical equipment is not elaborate, since alternating current may be used entirely.***

By N. H. SIMPSON
*Chief Chemist,*
and
PAUL R. CUTTER
*Research Chemist,*
*Consolidated Vultee Aircraft Corp., Fort Worth Division*

o o o

As bare magnesium alloys are susceptible to corrosion under most atmospheric contions, they must be properly protected prior to use in aircraft. Like aluminum, magnesium alloys cannot be successfully electroplated with a non-corrosive metal. Magnesium differs somewhat from other metals in that paint alone will not necessarily form a corrosion inhibitor, unless the surface of the metal has previously been treated with some effective chemical or electro-chemical process. Such an effective surface finish must not only act as a corrosion inhibitor itself, but must furnish such a paint base that the corrosion inhibiting properties of the paint are fully utilized.

Magnesium alloys are slightly softer than the other structural alloys, which is a help during machining, but they are also thus more susceptible to mechanical injury. Therefore, the value of any surface finish must necessarily be measured in terms of wear, or abrasion resistance, as well as its ability to inhibit corrosion.

Considerable testing of such standard chemical treatments as chrome-pickle, acid dichromate, specification AN-M-12, type 1 and 3, revealed that although the finishes gave fair corrosion protection, they offered no great resistance to abrasion and mechanical injury of the base metal. In fact, some finishes require as many as four coats of paint to insure proper insulation; hence, the weight is increased. The research engineers at the Forth Worth Division of Consolidated Vultee saw the need for a surface finish that would not only offer adequate protection from corrosion, but would actually shield the relatively soft metal from mechanical injury.

To produce such a finish, the research efforts were concentrated on developing a type of effective anodic process, whereby it was hoped that the extent of the surface finish could be compelled on the magnesium alloy parts by the amount of positive current applied.

The natural atmospheric oxidation corrosion products of magnesium are carbonates, hydroxides and oxides; all of which are highly insoluble and known to be protective. Therefore, it seemed conceivable that an effective uniform coating might be placed on magnesium alloys by the use of a positive (oxidizing) current in the presence of alkaline solution of either hydroxides, oxides or a combination thereof.

The initial attempts with alkaline solutions produced anodic coatings on magnesium alloys which were 100 times as resistant to abrasion as the acid dichromate finish, but offered no advantages over the accepted dichromate finish insofar as corrosion protection was concerned.

Extensive experiments were conducted to improve the corrosion factor by determining the most effective constituents, and their concentration, to be used in the alkaline electrolyte. This search investigated each and all possible combinations of the following: basic forming compounds of sodium and potassium; inorganic additives including neutral salts, and acid salts of sodium and potassium; organic additives usually in the form of relatively pure organic compounds, which were stable in an alkaline solution and contained at least one electro-negative polar group to direct the otherwise inert molecule to the anodizing surface of the magnesium alloy, where it could act as a depolarizer, and in some cases become part of the finish.

Simultaneously, a study to determine the proper controls was carried on, including type of current (AC or DC), current density, temperature of the electrolyte, and time of anodic treatment. Furthermore, experiments were conducted to develop an after treatment to properly neutralize the alkalinity of the anodic surface to insure good paint adhesion.

Since such anodic finishes, although they may appear smooth, are known to contain tiny microscopic pores which have the power of adsorption, a study of the effect of all possible organic and inorganic sealers was made.

From this extensive search an anodic process was developed which produces a finish on magnesium alloys by

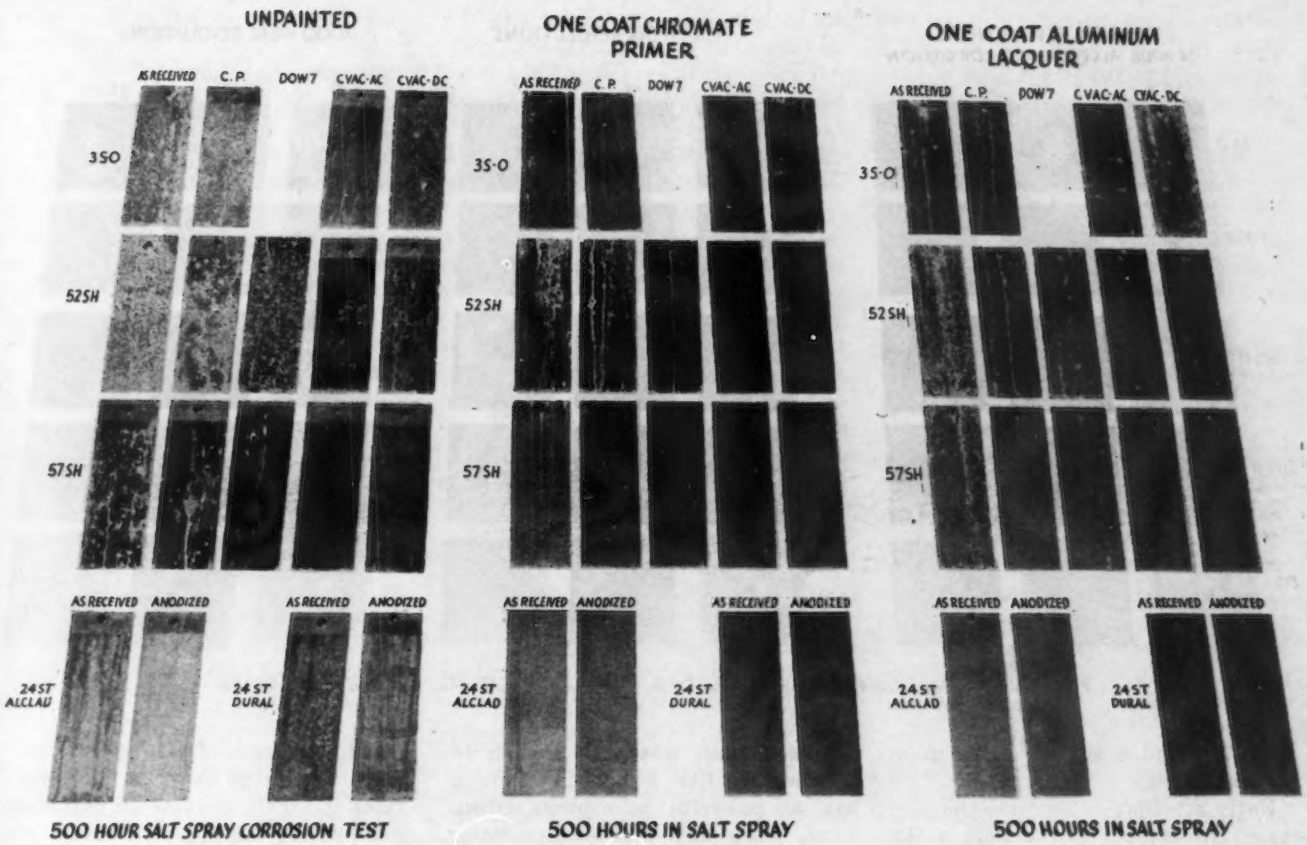



FIG. 1—Comparison of C.V.A.C. No. 1 finish, chrome-pickle, and acid-dichromate finished magnesium after 500 hr. in salt spray.

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either alternating or direct current that has proved superior at Convair to the finishes produced by the acid-dichromate and chrome-pickle treatments, specification AN-M-12, types 1 and 3, in resistance to both corrosion and abrasion.

The application of the new process is relatively simple.

After being properly degreased, the magnesium parts are placed in the alkaline electrolyte where they are made the cathode for electro-cleaning with a direct current. This removes the manufacturer's chrome-pickle film and prepares the surface for the anodic finish. If DC current is to be employed in producing the new finish, the current is merely reversed, and the work made the anode. If the AC finish is desired, the magnesium parts are connected to a low voltage AC transformer after electro-cleaning.

After anodizing, the parts are rinsed in hot water to remove excess caustic from the surface of the finish. The parts are then immersed in a warm, weak chromic acid solution for several minutes to properly neutralize any remaining alkalinity and to brighten the anodic surface. The parts are then dried and sealed by dipping them in a highly-thinned solution of zinc chromate primer or its equivalent.

Since either AC or DC current may be used in applying the anodic process, the finishes are known as C.V.A.C. No. 1, AC; and C.V.A.C. No. 1, DC. The AC current is preferred on sheet material and gives a smooth, black finish on such alloys as AMC52S-H and AMC57S and a white finish on AM3S-O.

The DC current produces a smooth, green surface on AMC52S-H,

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FIG. 2—Ultimate strength of 0.081-in. AMC 52S-H, after exposure to salt spray.

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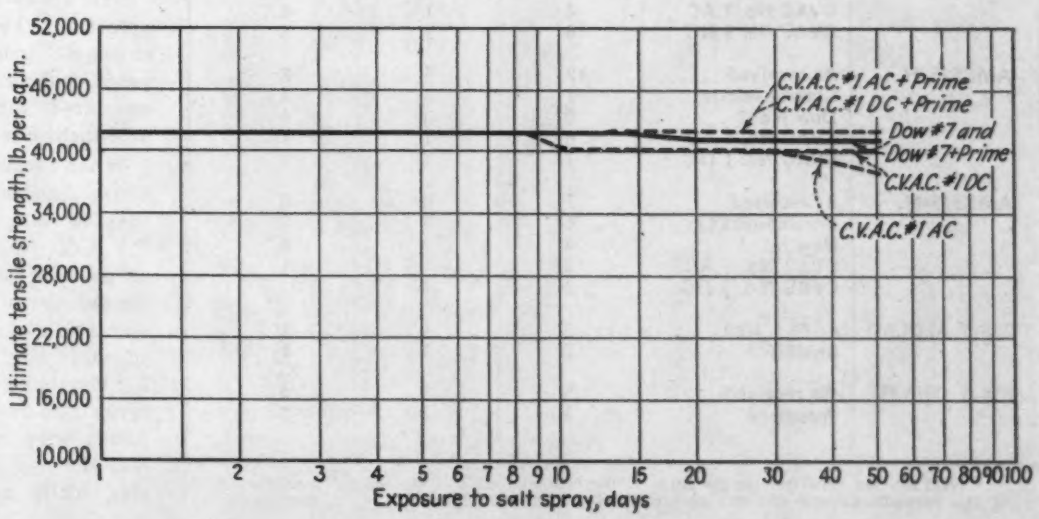


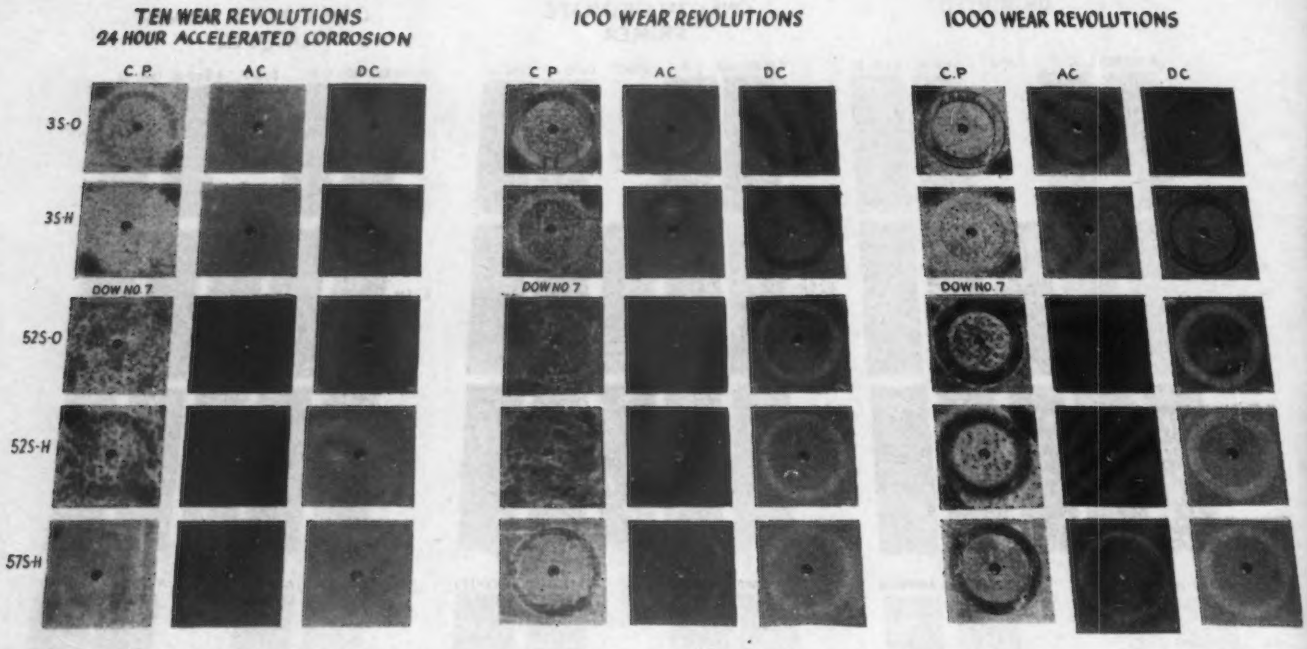



FIG. 3—Wear tests for the chrome-pickle finish, and the C.V.A.C. No. 1, AC and DC finishes.

AMC57-H and is slightly more effective on castings.

Early attempts to increase the corrosion resistance of the new finish over that of the acid dichromate met with some degree of success by the use of certain inorganic additives to the electrolyte, high temperatures, and alternating current.

It was then observed that although the new finish was very smooth in appearance, like all anodic films it has a powerful adsorption effect. Thus, when any possible non-water soluble material is placed on the surface of the anodically finished parts, it is immediately drawn within the oxidized film. Such material when uniformly applied to the C.V.A.C. No. 1, AC and DC finishes, greatly retard the attack of salt spray corrosion and in some cases entirely eliminates it. This increase in corrosion resistance on the application of similar organic sealers was not nearly as noticeable with the control finishes of chrome-pickle and acid-dichromate.

In the study of the organic sealers, one of the most effective materials tried was a thin dip coat of zinc chromate primer. As zinc chromate primer is normally applied in painting magnesium parts, its use as an organic sealer was considered most logical.

Since the effectiveness of any surface finish is not only based on its ability to inhibit corrosion itself, but also to provide such a paint base that the corrosion inhibiting properties of the paint are fully utilized, the superior corrosion protection derived from the new C.V.A.C. No. 1, AC and DC finishes became evident.

Salt spray tests were conducted to ascertain the effectiveness of zinc chromate primer as well as other paint coating on the new finishes as compared with chromate-pickle and acid-dichromate.

When specimens were given the above finishes and sealed with one coat of zinc chromate primer, the C.V.A.C. No. 1 finishes showed no progressive corrosion after 500 hr. in the salt spray while the chrome-pickle and acid-dichromate failed badly, as shown in Fig. 1 and recorded in Table I. Further test for 500 hr. in salt spray also revealed that two coats of paint were sufficient to completely seal the new finishes from all corrosion while as many as four were

TABLE I

Degree of Corrosion After 500 Hr. in Salt Spray

(The first trace of corrosion is indicated by 1, with ascending numbers to 12 for the most extensive corrosion observed.)

| Alloy | Surface Finish | Unpainted | One Coat Zinc Chromate Primer | One Coat of Aluminized Lacquer |
|---|---|---|---|---|
| AM350 | As received | 11 | 4 | 4 |
| | Chrome-pickle | 8 | 2 | 4 |
| | CVAC No. 1 AC | 4 | 1 | 4 |
| | CVAC No. 1 DC | 6 | 3 | 5 |
| AMC52S-H | As received | 12 | 6 | 8 |
| | Chrome-pickle | 7 | 5 | 3 |
| | Dow No. 7 | 8 | 3 | 4 |
| | CVAC No. 1 AC | 6 | 1 | 1 |
| | CVAC No. 1 DC | 7 | 1 | 1 |
| AMC57S-H | As received | 7 | 3 | 6 |
| | Chrome-pickle | 6 | 2 | 3 |
| | Dow No. 7 | 4 | 2 | 4 |
| | CVAC No. 1 AC | 3 | 1 | 1 |
| | CVAC No. 1 DC | 3 | 1 | 1 |
| 24S-T ALCLAD | As received | 3 | 1 | 1 |
| | Anodized | 2 | 1 | 1 |
| 24S-T DURAL | As received | 5 | 1 | 4 |
| | Anodized | 3 | 1 | 1 |

NOTE: As received magnesium = degreased, but still retaining a majority of the manufacturers' chrome pickle finish; as received aluminum = degreased.

necessary with the chrome-pickle and acid-dichromate.

Since the above findings were based on observation, an extensive test was conducted which employed 30 sets, of 48 each, of finished magnesium tensile coupons. The tensile specimens were subjected to salt spray corrosion from 0 to 1320 hr. When the various sets of tensile coupons described in Table II were pulled and the ultimate tensile strength plotted against time in the salt spray, it was found that the C.V.A.C. No. 1, AC or DC finished alloys, plus one coat of zinc chromate primer retained their tensile strength through 1320 hr. while the primed acid-dichromate showed signs of weakening much sooner, as demonstrated in Fig. 2.

Corrosion was also checked by placing the specimens to be tested in an accelerated corrosion bath made up on the basis of 11 grams of sodium chloride, 20 c.c. of 3 per cent hydrogen peroxide and 180 c.c. of distilled water.

If the attack was expected to be heavy, the gases given off were collected and the degree of corrosion determined by calculating the weight of magnesium displaced equivalent to the volume of hydrogen gas given off corrected to standard conditions.

This test (unprimed) showed that specimens treated with the new process were not progressively attacked but the acid-dichromate and chrome-pickle finishes were eventually destroyed after several hours' exposure to the above solution, leaving the magnesium metal exposed to progressive corrosion. This effect may be observed on the abraded specimens shown in Fig. 3, which were immersed for 24 hr. in the above solution.

To check the wearability of the new C.V.A.C. No. 1, AC and DC finishes, the Taber Abraser was employed. This instrument was equipped with CS17F coarse calibrase wheels operated under 1000-gm. wheel pressure.

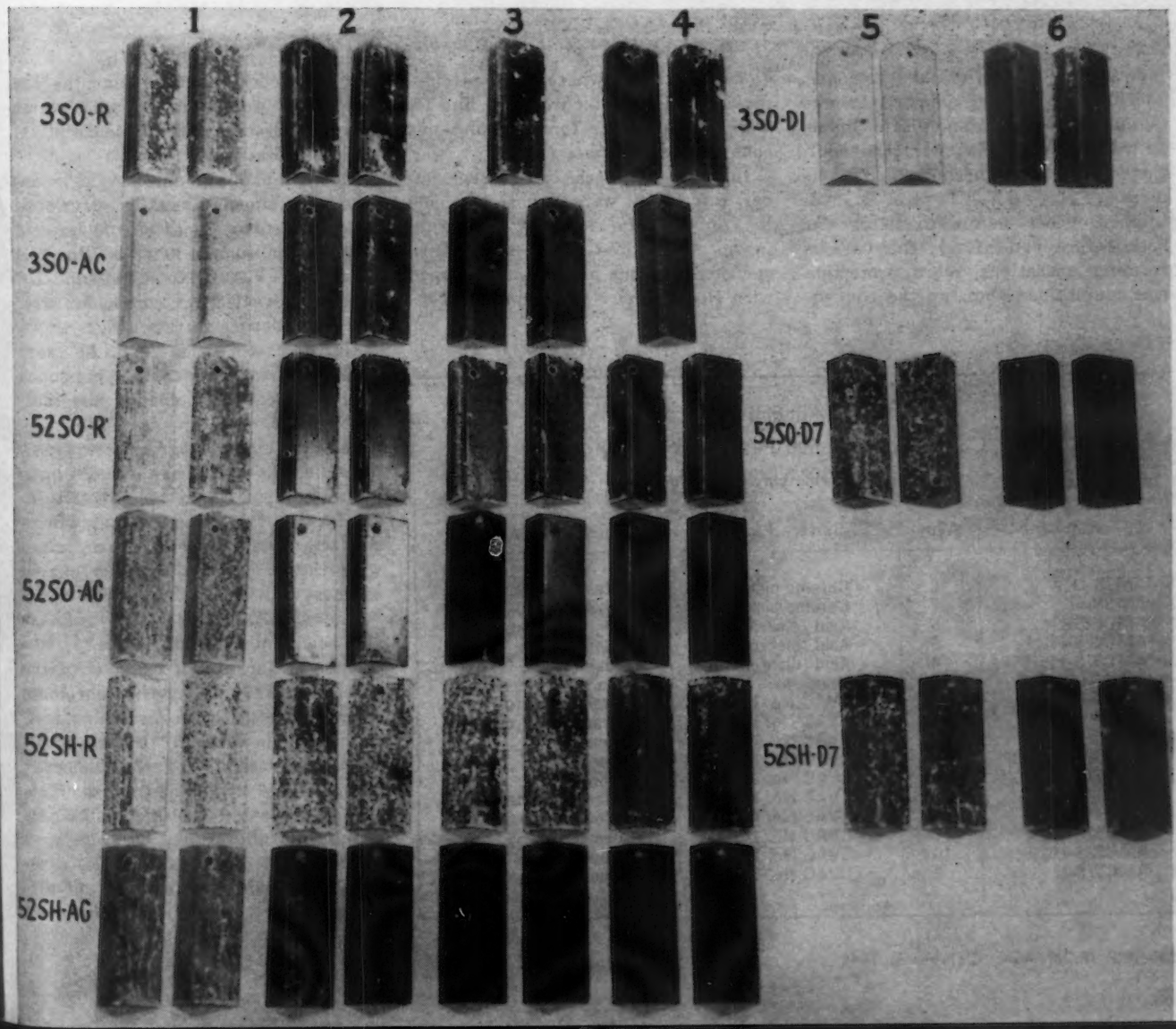
In most cases, the chrome-pickle and acid-dichromate finishes failed after one or two revolutions while the C.V.A.C. No. 1, AC and DC finishes withstood more than 1000 revolutions.

To check the accuracy of these observations, specimens shown in Table II were given 10, 100 and 1000 wear-revolutions respectively, and subjected to a 24-hr. accelerated corrosion test as previously described. This test definitely established the point that 10 wear-revolutions on the chrome-pickle and acid-dichromate finishes were more damaging than 1000 on either the C.V.A.C. No. 1, AC or DC finishes.

Since these finishes have excellent resistance to abrasion, their application prior to forming, in order to protect the relatively soft metal from injury through handling, was considered plausible.

Salt spray tests were conducted on various methods of forming, such as dimpling, bending and rolling, as

FIG. 4—Salt spray tests conducted on various methods of forming. Column (1), R = As Received, manufacturers' chrome-pickle finish. AC = C.V.A.C No. 1 AC process applied *before bending* (unsealed); Column (2), same as (1) except one thin dip coat of zinc chromate primer was applied before 90 deg. bend; Column (3), same as (1) except one thin dip coat of zinc chromate primer was applied after 90 deg. bend; Column (4), same as (1) except two thin dip coats of zinc chromate primer were applied, one before, and one after bending; Column (5), same as (1-R), but chrome-pickle and the acid-dichromate finishes are applied to 3SO, 52S-H, and 57S-H respectively, after bending; Column (6), same as (5), but an addition of one thin dip coat of zinc chromate primer was applied.



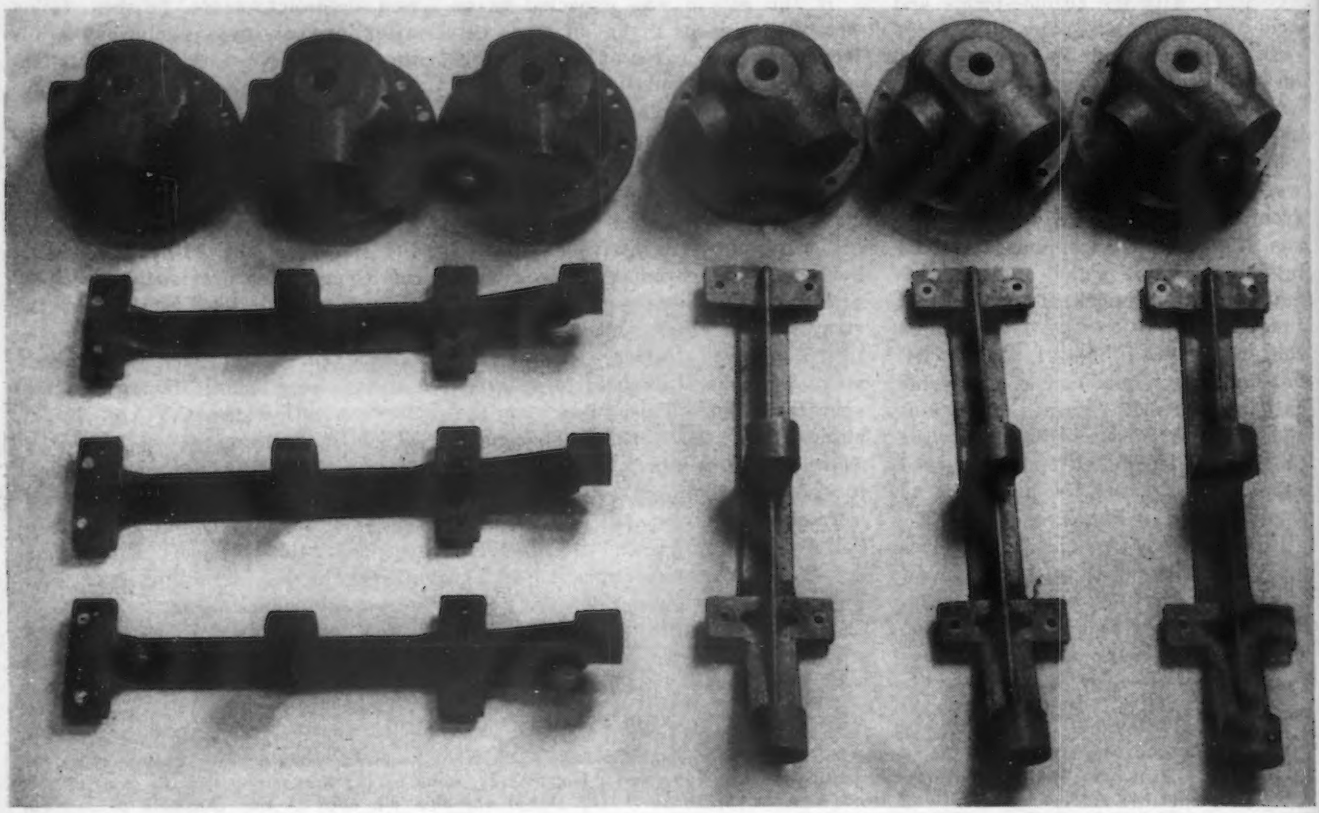


FIG. 5—Magnesium aircraft parts which have been protected by the process developed at Consolidated Vultee's Fort Worth division. The darker colored parts on the left were anodized with DC whereas those on the right were processed with AC.

indicated in Fig. 4, on 90-deg. bends. The new finish was compared to the manufacturers' chrome-pickle finish. It was observed that with the addition of the zinc chromate primer as a sealer for C.V.A.C. No. 1, AC, applied either before or after (or both before and after), the various forming operations, more protection was maintained than by the conventional methods where the chrome-pickle and acid-dichromate finishes were applied after forming, plus one coat of zinc chromate primer.

In some instances, the finishes under discussion were exposed to 500 hr. of artificial sunlight and rain in an accelerated weather machine, operated without filters and equipped with No. 12 and No. 22 sunshine copper electrodes. In this machine the specimens were sprayed with water hourly and subjected to intense ultraviolet radiation.

The (unprimed) chrome-pickle finished specimens usually developed traces of corrosion after 100 hr. and the acid-dichromate after 300 hr. The unsealed C.V.A.C. No. 1, AC and DC finishes revealed no corrosion after 500 hr. exposure to this test.

Galvanic corrosion can be very damaging to magnesium, inasmuch as it is the least noble of all structural alloys. The anodic coating produced by the new progress is an excellent dielectric and has, accordingly, been found to act as an effective insulator in prohibiting galvanic corrosion when magnesium parts protected with the new finish are brought in contact with dissimilar metals.

The C.V.A.C. No. 1 finishes have also been found to offer more protection to salt-spray corrosion than the chrome - pickle or acid - dichromate when in contact with dissimilar metals, which is probably the result of the greater depth of the dielectric film produced by the new finish. This should prove highly beneficial where magnesium alloys must be brought in contact with dissimilar metals, especially on the interior surfaces of airplanes where moisture may be trapped.

TABLE II

Corrosion After 600 Hr. in Salt Spray

(One coat of zinc chromate primer)

| Numbers | Alloy | Surface Finish | Degree of Corrosion |
|---|---|---|---|
| AM3S-O | 8 | Chrome pickle | Heavy attack |
| AMSS-H | 7 | Chrome pickle | Heavy attack |
| AMC52S-O | 6 | Acid (dichromate) | Light attack |
| AMC52S-H | 5 | Acid (dichromate) | Light attack |
| AMC57S-H | 4 | Acid (dichromate) | Light attack |
| ALCL4D-24S-T | 3 | None | None |
| AM3S-O | 2 | CVAC No. 1 AC | Trace of corrosion |
| AM3S-H | 1 | CVAC No. 1 AC | Trace of corrosion |
| AMC52S-O | 16 | CVAC No. 1 AC | None |
| AMC52S-H | 15 | CVAC No. 1 AC | None |
| AMC57S-H | 14 | CVAC No. 1 AC | None |
| AM3S-O | 13 | CVAC No. 1 DC | Medium attack |
| AM3S-H | 12 | CVAC No. 1 DC | Medium attack |
| AMC52S-O | 11 | CVAC No. 1 DC | None |
| AMC52S-H | 10 | CVAC No. 1 DC | None |
| AMC57S-H | 9 | CVAC No. 1 DC | None |

# Corrosion Ratings Of Metals

***. . . These summarized corrosion data on ferrous and non-ferrous metals were originally prepared by the Westinghouse Electric & Manufacturing Co. for the guidance of its engineering staff. The information is of such broad usefulness and is so conveniently arranged for reference that it is presented in these pages for more general application.***

AS a guide to the selection of metals for use under corrosive conditions, it is desirable to know their relative resistance to corrosion. The first step toward selection is to ascertain the conditions to which the equipment will likely be exposed, next define the conditions if possible and then compare the rates of corrosion of different materials under these conditions.

In comparing the corrosion resistance of metals and alloys it is necessary to consider the pattern of the attack and the extent of damage to equipment. If corrosion occurs in the form of pitting, or intergranular attack, it is certain to be more serious than if uniformly distributed over the surface. The loss of metal in terms of weight loss per unit of surface area is therefore not necessarily a measure of the damage done. For example the loss of metal resulting from the pitting of a tank or the intergranular attack of a highly stressed airplane part is negligible in comparison with the extent of the damage to the functioning of the unit.

The engineer is concerned with any type of corrosion that may interfere with the functioning of components. Tarnishing of metals is not normally an important deterrent to proper functioning and therefore is not under consideration.

In using the following ratings it is important that consideration be given to the form in which the metal is to be used, that is, as rolled metal, castings, or forgings. Moreover, the engineer should try to visualize possible damage caused by types of corrosion such as deep pitting or intergranular attack. The engineer is cautioned that consideration should also be given to possible serious effects of intergranular corrosion under internal and applied stresses, particularly cyclic stresses approaching the fatigue limits of metals and alloys in corrosive atmospheres. If fabrication or design develop such stresses, proper annealing or redesign should reduce the probability of failure.

## Comparative Ratings

The selection of metals and alloys for corrosive environments is largely the problem of a chemical or metallurgical engineer. The ratings given in the tables are intended merely as a guide to further investigation. They are defined as follows:

*A*—Practically complete resistance, or the alloy is the best of materials within its class. Probably safe to use.

*B*—Good resistance, as proved by being in common use. May replace materials given A rating to secure some other advantage. Probably safe to use.

*C*—Adequate resistance under favorable conditions which should be investigated beforehand. Use only with caution.

*D*—Sufficient resistance if adequate precautions are taken to reduce effect of corrosive conditions, as by coatings, cathodic protection, redesign, etc., or where appearance is not important and appreciable corrosion may be provided for or tolerated. Use should be avoided unless protected or unless appreciable corrosion can be tolerated or provided for.

*E*—Poor resistance—use only if better material is not available. Use should be avoided.

Plus and minus signs are used to permit greater differentiation between rates of corrosion resistance.

Corrosion ratings for metals in contact with salt water are subject to wide variations, depending upon geographic location, speed of flow and cyclic heating. Ratings given for sea water applications should be considered to supplement other means of arriving at a proper choice of material.

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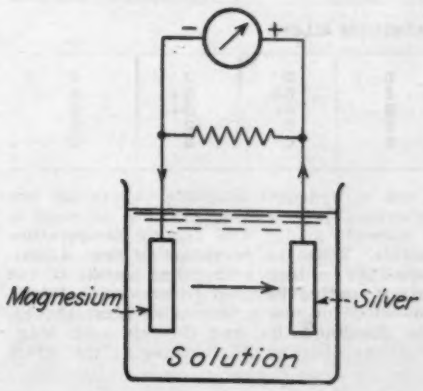
Diagram of typical galvanic action. Arrows indicate direction of current; inside cell from anode to cathode, outside cell from cathode to anode. Meter indicates cathode to be positive +, and anode negative —.




## Corrosive Solutions

Corrosion is a complex process. The expression of an opinion on the probability of corrosion is similar to forecasting the weather. Having considered all pertinent conditions, an intelligent judgment may be offered, but should certain conditions be overlooked or varied in the meantime, results may not be as predicted.

When a metal is immersed in a chemical solution there are many factors to be considered such as the concentration, temperature, movement and degree of aeration of the solution, and stresses, surface conditions and purity of the metal. The selection of materials for use in chemical solutions is a specialized problem for the chemical engineer and can be made only on the basis of information available to him. The information required is in general too complex to permit putting it into the form of a table.

Fresh waters vary tremendously in the degree of their corrosiveness, depending upon their source—lake, river or underground—and upon contamination by mines, sewage or industrial wastes. Since waters contain many impurities affecting their corrosiveness, they can be considered somewhat similar to chemical solutions. The selection of materials for use in them is a chemical engineering problem. It is extremely important that the engineer interpret the analysis of the water and consider the possibility of contamination with corrosive agents. This may require chemical treatment of water or the use of corrosion inhibitors.

The selection of materials for equipment to be used in a particular atmosphere is simpler than for that used in chemical solutions. Data have been accumulated on the comparative resistance to corrosion in typical outdoor atmospheres and in vapors commonly encountered in industrial processes. Under the heading of "Outdoor Atmospheres," data on rural, urban and marine atmospheres have been classified. It is sometimes difficult to classify an outdoor atmosphere. The atmosphere of a city along the sea coast would have urban and marine influences. The corrosion rating should be taken as the worst of the two.

While it is intended that comparisons be made only in vertical columns, there is also a tendency to make comparisons horizontally. If horizontal comparisons are limited to atmospheric conditions, it is believed that useful conclusions may be reached. For example, a material having an *A* or *B* rating in outdoor urban atmospheres but a lower rating for a particular industrial atmosphere should be carefully considered lest corrosion occur from industrial contamination of the enveloping atmosphere. This is particularly true of copper alloys since they are adversely affected by many chemical vapors. Such precautions as protective coatings or air conditioning might then be considered.

## TABLE I

### Corrosion Ratings of Alloys of Aluminum and Magnesium

*Data from the Aluminum Co. of America*

| Material | Alcoa Designation | Outdoor Atmospheres | | | Provisional Ratings for Sea Water |
|---|---|---|---|---|---|
| | | Rural | Urban | Marine | |
| **ALUMINUM AND ALUMINUM ALLOYS** | | | | | |
| 99% Al | 2S | A | B | B | B |
| Al-Mn | 3S | A | B | B | B |
| Al-Cu-Mg-Mn | 17S | B | B | C | D |
| Al-Cu-Mn-Mg | 24S | B | B | C | D |
| Al-Cu-Mn-Mg | 24C2 | A | B+ | B+ | B |
| Al-Si | 43 | A | B | B | B |
| Al-Si | 13 | A | B | B | B |
| Al-Cu-Si | 195 | B | B | C | D |
| Al-Cu-Si | C113 | B | B | C | D |
| Al-Cu-Fe-Zn | 112 | B | B | C | D |
| Al-Si-Cu-Mg | 355 | A | B | B | C |
| Al-Si-Mg-Cr | 53ST | A | B | B | B |
| Al-Mg-Cr | 52S | A | B | B | B |
| Al-Mg-Si-Cu-Cr | 61S | A | B | B | B |
| **MAGNESIUM AND MAGNESIUM ALLOYS** | | | | | |
| 99.8% Mg | AM2S | C | D | D | E |
| 98% Mg-1.5% Mn | AM3S | B | C+ | D+ | E |
| 95.5% Mg-3% Al-1% Zn-0.2% Mn | AM52S | B | C+ | D+ | D |
| 88.8% Mg-9% Al-2% Zn-0.2% Mn | AM260 | B | C | D | E |
| 90.8% Mg-6% Al-3% Zn-0.2% Mn | AM265 | B | C | D | E |

Aluminum alloys are used in ammonia and in hydrogen sulphide vapors but are not recommended for other corrosive atmospheres. These alloys may also be used in various concentrations of acetic, nitric and chromic acids. The scaling temperature of aluminum alloys is above their melting points. With the exception of zinc, aluminum and magnesium alloys should not be used in contact with other metals if the contact is likely to get wet unless an insulating coating be used to prevent galvanic corrosion. Magnesium alloys are not recommended for use in corrosive atmospheres. They are used in solutions of caustic alkalies, alkaline salts, and chromic acid. Magnesium alloys are not recommended for use above 400 deg. F. because of the effect of temperature on mechanical properties.

## Galvanic Couples

When two different metals are in contact and the contact area becomes wet with a conducting solution, there is an electric potential set up between them. For example if magnesium and silver are immersed in an electrolyte, a difference in potential of more than a volt may exist between the two metals as shown diagrammatically in the sketch. Likewise if different metals and alloys are successively brought into contact with silver or any other metal, they develop a characteristic potential and may be listed in the electromotive series below:

*(Data from The International Nickel Co.)*

**ANODIC END**
Magnesium
Magnesium alloys
Zinc
Aluminum 2S
Cadmium
Aluminum 17ST
Carbon steel
Copper steel
Cast iron
4-6% Cr steel
X { 12-14% Cr steel, 16-18% Cr steel, 23-30% Cr steel } Active
Ni-Resist
Y { 7 Ni-17 Cr steel, 8 Ni-18 Cr steel, 14 Ni-23 Cr steel, 20 Ni-25 Cr steel, 12 Ni-18 Cr-3 Mo steel } Active
Lead-tin solder
Lead
Tin
Z { Nichrome, 60 Ni-15 Cr, Inconel, 80 Ni-20 Cr } Active
Brasses
Copper
Bronzes
Nickel silver
Copper nickel
Monel
Z { Nichrome, 60 Ni-15 Cr, Inconel, 80 Ni-20 Cr } Passive
X & Y { 12-14 Cr steel, 16-18 Cr steel, 7 Ni-17 Cr steel, 8 Ni-18 Cr steel, 14 Ni-23 Cr steel, 23-30 Cr steel, 20 Ni-25 Cr steel, 12 Ni-18 Cr-3 Mo steel } Passive
Silver
Graphite
Gold
Platinum
**CATHODIC END**

Combinations of materials from different subgroups should be avoided, nor should combinations from extreme ends of subgroups be used when the area of the metal higher in the list is smaller than that of the metal lower in the list. The higher metal from this list will suffer accelerated corrosion to an extent determined by the corrosiveness of the environment,

the area of the more noble metal and the resistance of the electrical circuit. When in doubt as to whether an active-passive material will be active or passive, assume that it will be active if its area is relatively small and passive if its area is relatively large.

It is dangerous to use metals in the upper (anodic) end of the list in contact with those in the lower (cathodic) end without safeguarding such a contact by coating or other means to keep it from being wet with a conducting solution. Sea water is an electrolyte of high electrical conductivity and galvanic couples in its presence should generally be avoided. This is true especially of the alloys of aluminum and magnesium, iron, steel and high-zinc brasses, in contact with copper. If, however, the area of the metal (anodic) which would be corroded is very large compared to the cathodic copper, the total galvanic corrosion will be spread over this large area and the actual damage may not be serious. Copper pipe is usually connected with steel tanks without serious results; but use of a steel pipe with a copper tank would probably result in rapid corrosion of the pipe. The anodic metal suffers accelerated corrosion to an extent governed by the corrosiveness of the environment, the relative area of the cathodic metal and the resistance of the galvanic circuit which consists of the two metals and the solution.

Sometimes galvanic couples do not result in corrosive attack of the

## TABLE II

### Corrosion Ratings of Alloys of Iron, Nickel and Chromium

*Data from the International Nickel Co.*

| Steel or Alloy | A.I.S.I. Type No. | Outdoor Atmospheres | | | Specific Industrial Atmospheres (Wet) | | | | | Scaling Temperature Deg. F Note 1 | Provisional Ratings for Sea Water |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rural | Urban | Marine | Ammonia | Hydrogen Sulphide | Hydrogen Chloride | Sulphur Dioxide | Chlorine | | |
| Low carbon | — | D+ | D | D | B | D | D | D | D | 1000 | D+ |
| Copper bearing | — | D+ | D+ | D | B | D | D | D | D | 1000 | D+ |
| 4-6% Cr | 502 | D+ | D+ | D+ | B | D+ | D | D | D | 1150 | D |
| 12-14% Cr | 420 | B+ | B | C− | A | C | D | D | D | 1250 | C− to E Note 6 |
| 12-14% Cr 0.60% Mo | 416 | B+ | B | C− | A | C | D | D | D | 1250 | C− to E Note 6 |
| 16-18% Cr | 430 | A | B+ | C | A | B | D | D | D | 1550 | C− to E Note 6 |
| 23-30% Cr | 446 | A | A | C+ | A | A | D | B | D | 2000 | C to E Note 6 |
| 7% Ni-17% Cr | 301 | A | A | B+ | A | A | D | C | C | Not used for oxidation resistance. | C to E Note 6 |
| 8% Ni-18% Cr | 302 303 304 | A | A | A− | A | A | D | B | C | 1650 | C to E Note 6 |
| 8% Ni-18% Cr 1% Cb | 347 | A | A | A− | A | A | D | B | C | 1650 | C to E Note 6 |
| 8% Ni-18% Cr 0.5% Ti | 321 | A | A | A− | A | A | D | B | C | 1650 | C to E Note 6 |
| 14% Ni-23% Cr | 309 | A | A | A | A | A | D | B | C | 2000 | C+ to E Note 6 |
| 12% Ni-18% Cr 3% Mo | 316 | A | A+ | A+ | A | A | C | A | B | 1650 | C+ Note 6 |
| 20% Ni-25% Cr | 310 | A | A+ | A+ | A | A | D | B | C | 2000 | C Note 6 |
| Nickel | — | A | A− | A+ | C− E Note 5 | B | C− B | C | B | Note 2—1900 Note 3—1000 Note 4— 700 | C− |
| 30% Ni-70% Cu | — | A | A− | A | C− E Note 5 | C− | C+ | B | C+ | — | A Note 7 |
| Monel | — | A | A | A | C− E Note 5 | B | B | C | B | Note 2—1000 Note 3—1000 Note 4— 650 | A Note 7 |
| 80% Ni-20% Cr | — | A | A | A+ | A | A | B | B | B | 2100 | C− |
| Inconel-88% Ni, 7% Fe-13% Cr | — | A | A | A+ | A | A | B | B | B | Note 2—2000 Note 3—1500 Note 4—1000 | C− |

Note 1—Values assume substantially constant temperature operation. They are lower for cyclic heating and cooling to an extent dependent upon the frequency and range of temperature fluctuations.

Note 2—Scaling temperature in low sulphur atmosphere.

Note 3—Scaling temperature in high sulphur oxidizing atmosphere.

Note 4—Scaling temperature in high sulphur reducing atmosphere.

Note 5—Not recommended primarily to resist ammonia attack, but may be used where resistance to ammonia in low concentrations is an incidental requirement.

Note 6—In stainless steels, the poorer ratings refer to exposure to quiet or slowly moving sea water, especially where marine organisms may become attached and induce pitting. The better ratings refer to contact with sea water at high velocity, such as encountered by pump impellers for which the higher alloyed stainless steels frequently give excellent service, especially in polluted harbor waters. The straight chromium stainless steels perform best when used in high velocity installations. They should not come into galvanic contact with bronzes.

Note 7—The 70:30 copper nickel alloy is preferred for condenser tubes, salt water piping and boat sheathing. Monel provides high strength, excellent resistance to erosion, and a favorable galvanic relationship to bronzes. It is the preferred material for valve trim, shafting, and for vital parts of assemblies which include bronze components.

anodic metal as might be expected. The condition which prevents the expected attack has been named passivation, but has received no universally accepted explanation. Alloys containing chromium are most pronounced in their passivity which accounts for its wide use in corrosion resistant alloys. Passivity also depends upon the nature of the solution. If the solution is one which destroys passivity, the alloy is then said to have become active and will be attacked.

These active-passive alloys are designated in three groups, X, Y, and Z, which under certain conditions become active and are then higher on the list. It is obvious that the conditions of use must be investigated before a passive metal or alloy is recommended. When in doubt as to whether an active-passive material will be active or passive, assume that it will be active if its area is relatively small and passive if its area is relatively large.

## TABLE III

### Corrosion Ratings of Copper and Copper Alloys

*Data from the American Brass Co.*

| Material | Outdoor Atmosphere | | | Specific Industrial Atmospheres (Wet) | | | | | Provisional Ratings for Sea Water |
|---|---|---|---|---|---|---|---|---|---|
| | Rural | Urban | Marine | Ammonia | Hydrogen Sulphide | Hydrogen Chloride | Sulphur Dioxide | Chlorine | |
| **COPPERS** | | | | | | | | | |
| Copper, tough pitch | A | A– | A | E | C | C | B | C | B– |
| Copper, phosphorized | A | A– | A | E | C | C | B | C | B– |
| Copper, oxygen free | A | A– | A | E | C | C | B | C | B– |
| Cupaloy | A | A– | A | E | C | C | B | C | B– |
| Cadmium copper | A | A– | A | E | C | C | B | C | B– |
| Beryllium copper | A | A– | A | E | C | C | B | C | B– |
| Selenium copper | A | A– | A | E | C | C | B | C | B– |
| **BRASSES** | | | | | | | | | |
| Gilding metal (95-5) | A | A– | A | E | C | C | B | C | B– |
| Commercial bronze (90-10 Zn) | A | A– | A | E | C | C | B | C | B– |
| Red brass (85-15) | A | A– | A | E | C | C | B | C | B– |
| Low Brass (80-20) | A | B+ | A– | E | C+ | C | C | C | C+ |
| High brass (70-30) | A | B | B+ | E | B– | E | C– | E | C |
| High brass (68-32) | A | B | B+ | E | B– | E | E | E | C |
| High brass (66-34) | A | B– | B+ | E | B– | E | E | E | C– |
| Muntz Metal (60-40) | A | B– | B+ | E | B– | E | E | E | C– |
| **LEADED BRASSES** | | | | | | | | | |
| Leaded commercial bronze (88-10Zn-2Pb) | A | A– | A | E | C | C | B | C | B– |
| Hardware bronze (85-13Zn-2Pb) | A | A– | A | E | C | C | B | C | B– |
| Low-leaded tube brass | A | B– | B+ | E | B– | E | E | E | C– |
| Low-leaded brass | A | B– | B+ | E | B– | E | E | E | C– |
| Medium-leaded brass | A | B– | B+ | E | B– | E | E | E | C– |
| High-leaded brass | A | B– | B+ | E | B– | E | E | E | C– |
| Extra-high leaded brass | A | B– | B+ | E | B– | E | E | E | C– |
| Leaded Muntz metal | A | B– | B+ | E | B | E | E | E | C– |
| Forging brass | A | B– | B+ | E | B | E | E | E | C– |
| Architectural bronze (57Cu-40Zn-2.5Pb) | A | B– | B+ | E | B | E | E | E | C– |
| **PHOSPHOR BRONZES** | | | | | | | | | |
| Phosphor bronze 1-1¼%Sn | A | A– | A | E | C | C | B | C | B– |
| Phosphor bronze 5%Sn | A | A– | A | E | C | C | B | C | B– |
| Phosphor bronze 6%Sn | A | A– | A | E | C | C | B | C | B– |
| Phosphor bronze 8%Sn | A | A– | A | E | C | C+ | B | C | B |
| Phosphor bronze 10%Sn | A | A– | A | E | C | C+ | B | C | B+ |
| Hard bronze (88Cu-4Sn-4Zn-4Pb) | A | A– | A | E | C | C | B | C | B |
| **SPECIAL BRASSES** | | | | | | | | | |
| Admiralty | A | B | B+ | E | B– | E | C | E | B+ |
| Naval brass | A | B | B+ | E | B | E | E | E | B– |
| Leaded naval brass (60Cu-38Zn-1.5Pb) | A | B | B+ | E | B | E | E | E | B– |
| Manganese bronze | A | B | B+ | E | B | E | E | E | B– |
| Aluminum brass | A | B | B+ | E | B– | E | C | E | A– |
| **CUPRO-NICKELS** | | | | | | | | | |
| Cupro-nickel (70Cu-30Ni) | A | A– | A | E | C– | C+ | B | C+ | A |
| Nickel silver, Alloy A (18%Ni-65%Cu-17%Zn) | A | A– | A | E | C– | C+ | B | C+ | B+ |
| *Nickel silver (30%Ni-47%Cu-23%Zn) | A | B | A | E | C | E | C | E | B |
| *Nickel silver, Alloy B (18%Ni-55%Cu-27%Zn) | A | B | A | E | C | E | C | E | B |
| **SPECIAL BRONZES** | | | | | | | | | |
| Silicon bronze | A | A– | A | E | C | C+ | B | C+ | B– |
| 5% Aluminum bronze | A | A– | A | E | C+ | C | B | C | B+ |
| AlNi-Fe-Cu | A | A– | A | E | C+ | C | B | C | B+ |

* Used principally for electrical resistance properties.

# Health Hazards in Cadmium Plating

By PAUL A. NEAL and
LAWRENCE T. FAIRHALL
*Industrial Hygiene Research Lab.*
*National Institute of Health*
*Bethesda, Md.*

*and*

K. GUSTAF SODERBERG
*Conservation Div. War Production Board*
*Washington*

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THE first symptoms of inhalation of cadmium containing dust and fumes are usually dryness of the throat, cough, headache, vomiting and a sense of constriction of the chest. Later symptoms are predominantly referable to the respiratory system and are characterized by cough, pain in chest, severe dyspnea and prostration. Such severe lung damage usually manifests itself hours after exposure, and cadmium fumes can be breathed in fatal concentrations without enough discomfort to drive the worker away from the exposure. Ingestion of cadmium salts through eating and drinking of acid food products which have been in contact with cadmium plated articles has also caused a number of cases of poisoning. Extensive study of permissible concentrations of cadmium has not been made with respect to exposure of human beings. However, the American Standards Association in its "American Allowable Concentrations of Cadmium" has accepted as a maximum 1 mg. of cadmium in 10 c.m. of air.

Few unsuspected hazards surround the cadmium plating operation itself. Cyanide plating solution is poisonous so care should be taken that it does not reach the mouth of the operator either by splashing or by way of his hands. Where insoluble steel anodes are used, for example, to plate into deep recesses, considerable spray may evolve from the plating tank. In such cases the tank should be ventilated in the same fashion as a chromium plating tank. No greater hazards are encountered in operations incident to cadmium plating. In mixing a plating solution it is imperative that cadmium containing salts not be inhaled.

### Burning Cadmium Dangerous

It is particularly dangerous to burn cadmium. Deaths are recorded as having taken place when a workman has used a blow torch to burn off cadmium plate from inside of tanks and from plating racks. Cadmium should be removed by electrolytic or chemical stripping. Plating departments should avoid remelting of cadmium scrap unless the melting equipment is thoroughly ventilated. It is better to send the scrap to the anode supplier who has satisfactory equipment and knows how to process it.

It is common to heat cadmium plated parts in an oven for the purpose of eliminating hydrogen embrittlement. Such heating requires careful temperature control so that cadmium fumes are not formed in the process. Care must be taken that the specified temperature not be exceeded in any part of the oven.

Industrial accidents have recently occurred from welding operations carried out on cadmium coated articles.

Where cadmium fumes are evolved and space limitations do not permit the use of adequate ventilation, workmen should be supplied with positive pressure masks. Where acid fumes are also present, a soda lime cartridge should be attached to the respirator.

There is no record of any cadmium poisoning caused by handling cadmium plated parts on the assembly line or elsewhere. It is, of course, a wise precaution to wash the hands before subsequently handling food.

# *Welding Machines Converted to Generators*

By HARRY BAYLIE
*Chief Electrician,*
*J. H. Mathis Shipbuilding Corp.*

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A RECENT contract for Army cargo boats required the use of a power generator for test purposes and for supplying ships with auxiliary power at the fitting out dock. These boats require 230 volts d.c., three wire service for power and lighting. Unable to obtain a motor-generator set inside of six months' delivery, it was decided to do a little experimenting with some welding generators.

The requirements called for a 40-kw. generator, since the largest piece of equipment to be tested was 50 hp. at 230 volts d.c. Since a group of 300-amp. Hobart arc welders connected for constant potential were found to have good regulation, by experimentation it was found that they could put out 115 volts without a very costly changeover. This change was made by substituting an additional shunt winding in place of a part of the series field coils and making these extra shunt coils self-exciting. By connecting two of these machines in series 230 volts was obtained, with a midtap at 115 volts. Although their combined output should really be no more than 30 kw., no trouble was encountered with these machines running at considerable overload for limited periods of time.

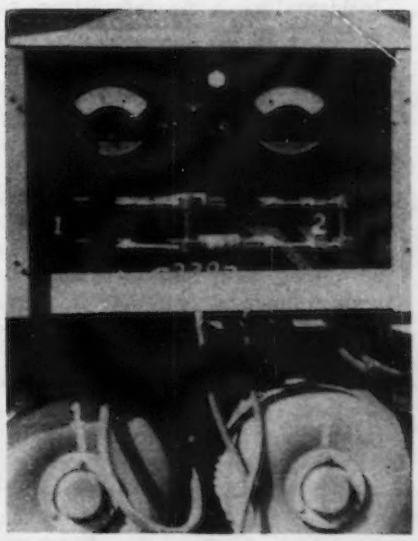

*Photo courtesy Hobart Brothers Co.*

BY using separate switches on each generator of a pair, it is possible to obtain either 115 or 230 volts.

All of power facilities on the piers and ways terminate in power panels with fused receptacles up to 100 amp. which makes it convenient to shift the individual machines from boat to boat. Two units have been made up and are supplying auxiliary service to ships at the docks.

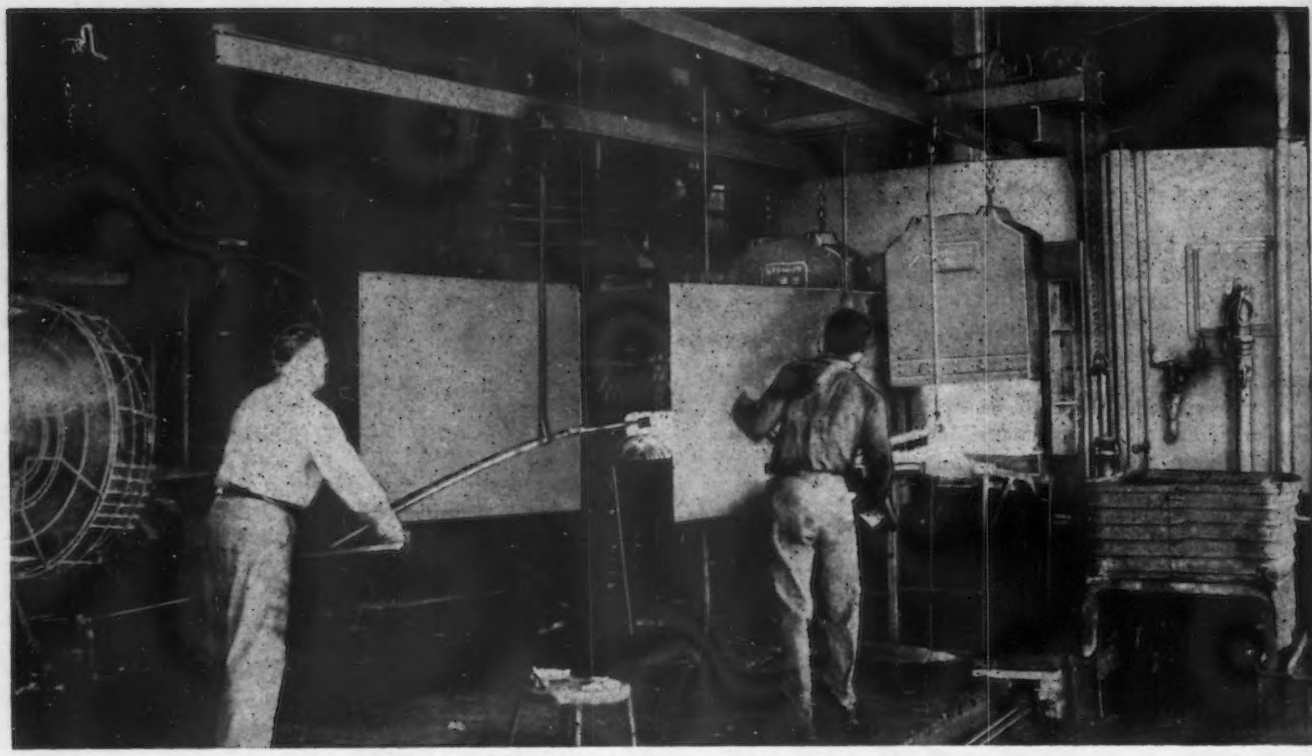

FIG. 1—Operator on right is charging cold billets into the Stewart rotary hearth forge while the operator on the left is removing hot billets prior to the piercing and forming operation. Note the simplicity of the handling tongs developed at Oakes Products. Doors of forge are operated hydraulically by foot pedal in foreground.

# Heat Treating 5-In. Navy Shells

WHEN the Navy awarded the contract for fabrication of 5-in. projectiles to the Oakes Products Division of Houdaille-Hershey Corp. at Decatur, Ill., the company immediately took steps to install new conveyor type heat treating equipment. The Stewart Industrial Furnace Division, Chicago Flexible Shaft Co., Chicago, collaborated in the design of the system and furnished special furnaces and machinery for the handling of these shells.

The billets, notched and broken from bar stock, have an average weight of 67 lb. Care is taken to place billets into separate heats which are fabricated separately through the operations. For forging, billets are put into a Stewart rotary hearth furnace and heated to 2200 deg. F. (Fig. 1). Oven capacity is 1200 billets or 8000 lb. per hr. and the time required to bring to heat is 2 hr. The billets are run over from the furnace with tongs of special design and placed on the gravity conveyor where they are brought into position in a corner roller and then through a descaler.

After one end of the billet has been descaled, it is brought to the pierce die by conveyor and placed into the piercing press die pot. When the pierce pot is rammed home the metal of the slug is forced up around the punch and the result is a cavity the size of the punch.

Incidentally, it is interesting to note that a change in the die pot from cast iron to FCC-5X steel increased the number of pieces per pot life from 800 to 4000. The piercing punch has been redesigned and the length cut in half by employing an adapter. The material was changed from Thermold "B" to Thermold "A" steel thereby increasing the tool life from 1000 to 1500 pieces with two recuts. The slugging punch is made out of Thermold "B" or T.C.M. steel. Tool life is 5000 pieces with two recuts.

After piercing, the forging is pushed out of the die pot by a knockout, the scale is blown from the cavity and the forging is pushed on conveyor to the draw bench. The hydraulic draw bench forces a mandrel into the cavity and presses the forging through rollers, giving the billet its final rough form.

The above mentioned mandrel is now made out of Thermold "A" instead of Thermold "B" and the number of pieces per tool life has increased from 2000 to 3000 with two recuts. The draw bench rollers are now made of FCC-CMS castings instead of forgings and the number of pieces per tool life is 60,000 with three recuts.

After final forming the shell is rolled onto a concentricity machine which has a special gaging device used to check the cavity for concentricity. At this point the shell has cooled to about 1900 deg. F. In the next operation, the rough shell is annealed at approximately 1300 deg. F. with a Brinell reading of about 200 resulting.

After a rough turning operation the shell is placed in a special induction furnace and the nose end heated to 1850 deg. F. in 28 sec. Forming is done in a No. 58½ Bliss press from which the shell falls into an overhead conveyor that conveys the shells to the heat-treating furnace.

The Stewart heat-treat, quench and draw furnaces are specially built for this type of shell (Fig. 2). The tube type hardening furnace can push five

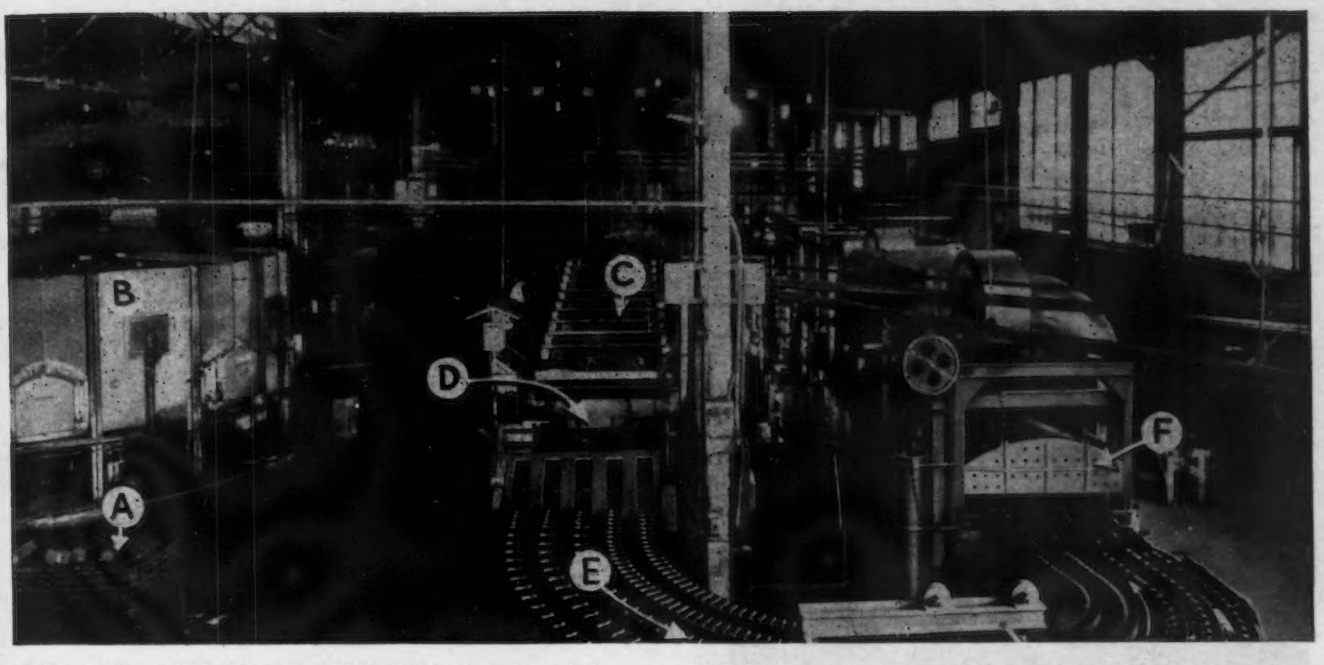


FIG. 2—Showing circle conveyor taking shells from quench tank onto draw furnace belt. A. Steel billets ready for charging into rotary hearth forge furnace. B. Rotary hearth furnace (Fig. 1). C. Pusher hardening furnace. D. Automatic quench tank (oil temperature 130 deg. F.). Inside and outside spray achieves uniform quenching. E. Roller U-turn automatic transfer to draw furnace. Conveyor carries five shells abreast. F. Conveyor recirculating draw furnace (temperature 1100-1180 deg. F. Time: 1 hr. 27 min.)

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shells into the heating chamber every 2¾ min., with a capacity of 110 per hr. Temperature is around 1600 deg. F and it requires 1¼ hr. for the heat and soak desired.

The shells are now discharged into a Stewart forced automatic oil quench in which the oil is maintained at 130 deg. F. by an evaporative cooling unit. The shells are in oil about ¼ hr., then conveyed into the draw furnace. Here they are brought back up to 1240 deg. F. and stay in the recirculating conveyor furnace for 1½ hr. The shells pass from draw into a cooling chamber where they are gradually cooled to approximately 160 deg. F. (Fig. 3). All of this consumes 4 hr. to properly heat treat the shell. Constant checks are being made in the laboratory to make sure the shells are of the proper hardness.

Although heat treating causes only a minor amount of scale, the cavity must be shot blasted to remove it. The shell is placed on an indexing table where it passes under air jets blowing shot at 90 lb. pressure. The grit used is No. 25. The cavity undergoes no machining; it is merely inspected and sprayed with rust preventive. The shell is now ready for the finish machining.

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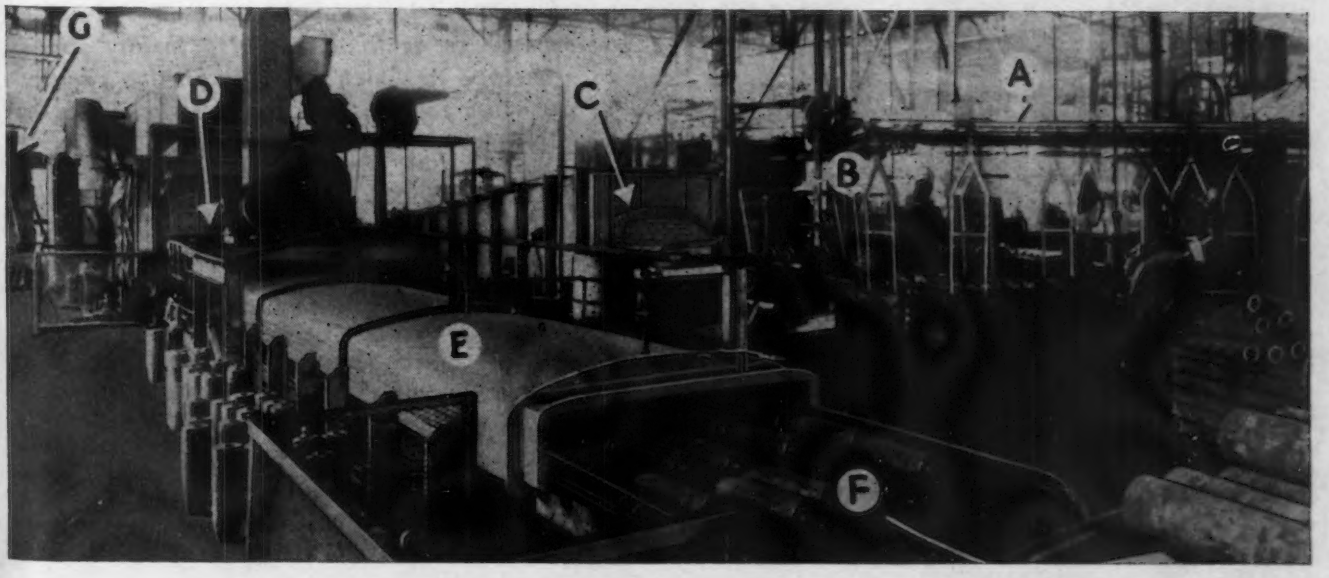
FIG. 3—Discharge end of 5-in. Navy shell line. Shells are coming out of cooling muffle from Stewart draw furnace in background. Furnace at right is Stewart hardening furnace. A. Conveyor carrying shells from hot nosing press to Stewart pusher type hardening furnace. B. Hardening furnace shell loading mechanism. C. Pusher type hardening furnace. D. Discharge end of recirculating conveyor draw furnace. E. Conveyor cooling chamber (water and recirculation). F. Discharge to shot blast. G. Evaporative type quench oil cooler.



# Precleaning Low Carbon Steel

## For Spot Welding

By JEAN GAUTHIER
*Supervisor, Process Engineering, Kelite Products, Inc., Los Angeles*

STEEL tool box which pulled apart at faulty welds. This is a common result of spot welds made on contaminated surfaces.

WHEN considering the almost unbelievable quantities of low carbon steel in use today, it is difficult to understand the common failure to clean and process this metal for fabrication by resistance welding. Practical cleaning processes are not difficult to maintain and are quite inexpensive when compared with the rejection losses which result from failure to clean or careless handling of the cleaning methods. It is a matter of record in thousands of plants that a few rejects or reworks are far more costly than the entire cleaning expense.

Sheet steel as delivered from the mills is usually coated with a rust proofing oil or grease which may or may not be easy to remove. Furthermore, in forming the steel into myriad shapes and articles there are subsequent applications of cutting and drawing oils. All of these make for questionable surface conditions which are likely to cause trouble when resistance welding or painting must occur. Some control should be maintained to insure proper surface condition.

In the case of aircraft and ordnance parts all too many rejections are found due to spot weld failures, caused largely by oxidation and contamination on the steel. With civilian commodities, too many poorly assembled products reach the consumer for the same reasons. How many times have you purchased a piece of kitchenware, a steel tool box or some similar item only to have the welds break out almost before you reached home? This seems almost unforgivable when you consider that the operation cost is no more for good welds than for poor ones.

***. . . A simple procedure is outlined for removing oil, soil and oxide from low carbon steel sheets so as to assure structurally sound welds and to prepare a surface to which paint or plating readily adheres. Basically, the process follows that found so essential in precleaning aluminum prior to spot welding.***

An impressive percentage of such failures can be attributed to improper preparation or lack of preparation of the metal for the treatment it is to receive in the manufacturing cycle.

There seems to be common acceptance of the notion that steel which has been formed with drawing or cutting lubricants can be spot welded while still oily and greasy (with carbon dust, rust and soil impregnated in it), assembled and painted with no cleaning involved. Some operators reluctantly give the parts a mild wash in some solvent or a brief degreasing treatment. A few have taken complete steps to control their steel fabrication problems with progressive modern cleaning methods and pH control; as a result, they are experiencing none of the rejections or other troubles caused by dirty metal.

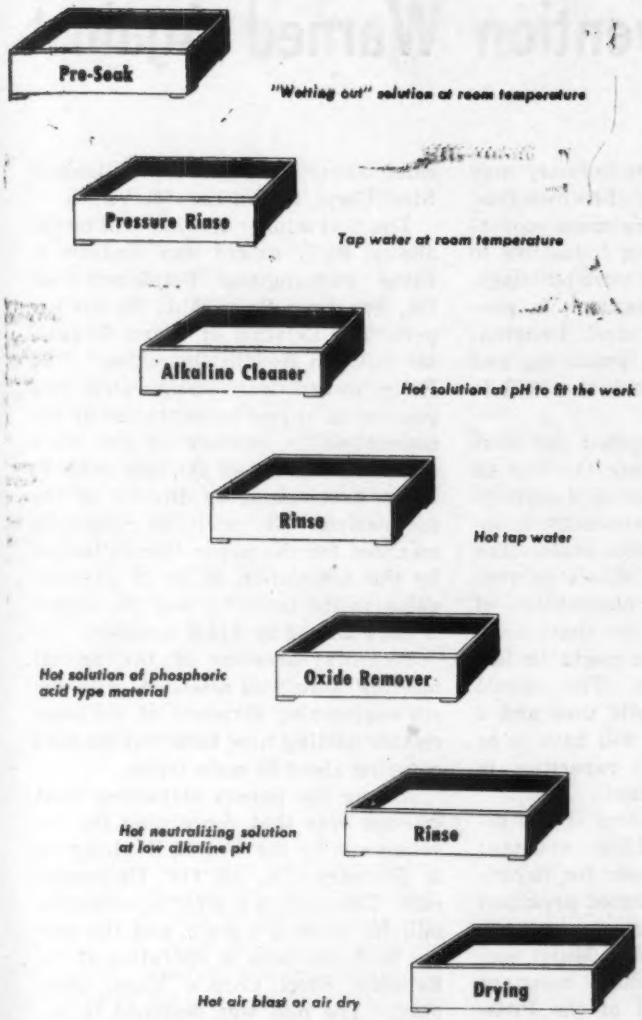
The steps involved in the cleaning of dirty, oxidized steel are simple to control and effective in their application (see flow chart).

### Process Sequence

On metal which has a surface coating of oil or grease, whether lard, petroleum or fish oil, a presoak in a wetting out material is indicated. The wetting action is the ability of the chemical agent to penetrate through and under the soil and to spread along the metal, thus breaking the bond which holds the soil fast—the chemical having a greater affinity for the metal surface than the soil itself. After this bond is broken by the wetting action, a rinse with tap water under pressure completes the first step.

Next is immersion of the part in an alkaline bath with pH equal to the job at a temperature of 190 to 200 deg. F. This bath should have some agitation such as air injection or

FLOW SHEET INDICATING THE ELEMENTS IN AN INSTALLATION SUITABLE FOR CLEANING AND PROCESSING LOW CARBON STEEL.

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**LEFT**

FLOW sheet indicating the elements in an installation suitable for cleaning and processing low carbon steel prior to spot welding.

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**BELOW**

TEST panels of SAE 1010 steel. The top portion shows the accumulation of dirt and grease picked up in the shop; the bottom portion has been cleaned by the process outlined in the accompanying flow sheet.

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surging from an impeller. Fifteen to 20 min. is usually sufficient time in the alkaline bath, followed by a hot water rinse with agitation.

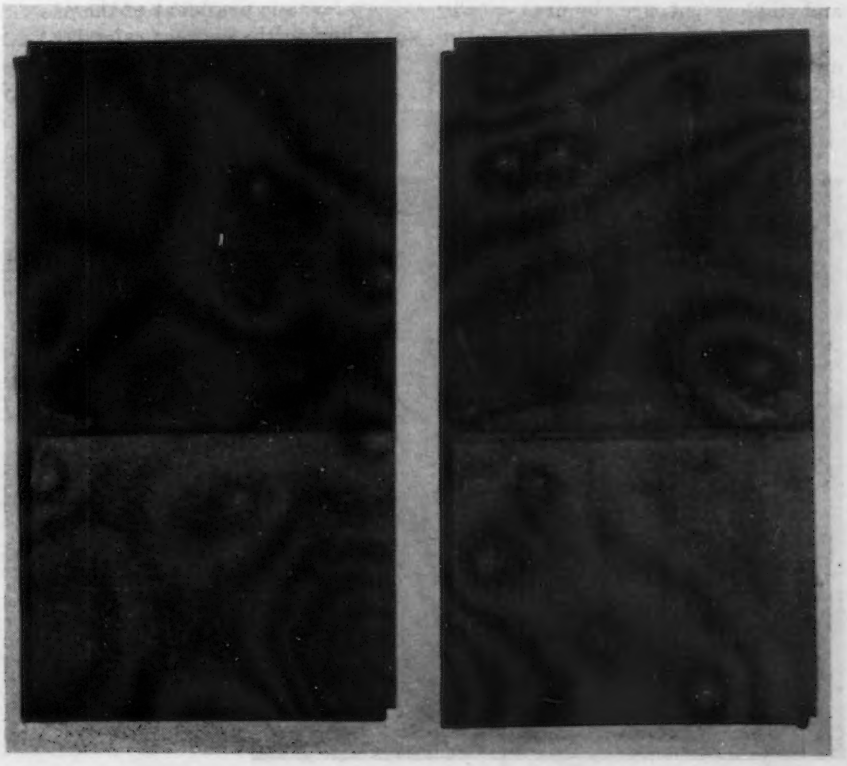
A part that has been thus treated is clean and free of fatty, greasy deposits, but rust or oxide may still be present. This rust is removed by immersion in a phosphoric acid type material at varying percentages from 15 to 25 per cent by volume with water. A heated solution is more effective, 140 to 160 deg. being quite satisfactory, although in some instances a cold solution can be used. The solution should be properly inhibited so that healthy metal is not attacked and only the oxide is removed. There are several proprietary materials available for this bath. It should be remembered that not all phosphoric type treatments lend themselves satisfactorily to welding.

A hot water rinse containing a low alkaline pH should follow the oxide removal treatment to neutralize and leave the surface inhibited against oxidation. The pH value should be low so as not to leave an influence unfavorable to good paint adhesion.

Parts treated after the above described phosphoric treatment will be found to be inhibited against oxidation for a period of time and, as a result, fabrication, welding or finishing can be accomplished on a part which is chemically clean. Good welds and good paint adhesion are the result.

Articles made of steel and finished by the above method show less tendency to oxidize under the paint and also lend themselves to certain types of plating very well. The treatment throughout is not critical and tolerances are not affected as they are in some of the more critical pickling and cleaning methods. The solutions can be properly maintained with simple, comprehensive pH control meters which are available.

There is little doubt that the future will see the development of greater consideration for the above treatments on all types of steel, stainless included, since higher welding efficiency as well as better paint and finish adhesion are desired by all manufacturers. The metal working industry has given considerable attention to the processing of aluminum and its alloys, and it is now realized that some of the demands of aluminum processing are also necessary on steel. Operators who have experienced difficulty will find it to their advantage to pay more attention to cleaning since it results in a better product at little or no increase in manufacturing cost.



# AISE Convention Warned Against

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ONE of the forces which must be guarded against in the post-war period is the restraint on production and employment to support a preconceived price level, George P. Comer, economic adviser to the Antitrust Division of the Department of Justice, told some 2500 members of the Association of Iron and Steel Engineers at its 40th annual meeting in Pittsburgh last week. While this will be no problem in the early months after the war when the nation's stock bins of consumer goods are being filled, sooner or later industry will face the inevitable problem of choosing between maximum production and maximum prices.

In the early years of the depression, many of the country's industries seemed to choose in favor of prices against employment. The iron and steel industry, for example, showed a decline in prices during the early thirties of about 15 per cent and a cut in payrolls of 75 per cent.

This sets the job then to be done, Mr. Comer said. It is a job of maintaining the maximum of production and employment, area by area, city by city, and plant by plant. Unfortunately, because steel products are largely capital goods rather than consumer commodities, the industry may not be complete master of its own fate. Therefore, the industry must cooperate with the consuming industries to make more steel, build more buildings, make more motor cars, and, in general, to consume more steel. Imagination and ingenuity in producing and selling is the only attitude that will do the job.

Mr. Comer also pointed out that steel plants built during the war in the Far West might cause a shift in the industry if the plants continue operation at a considerable scale. The new western capacity equals or even exceeds the prewar consumption of steel mill products in that area. Therefore, this market might be lost to eastern producers. This would mean that new domestic uses and a greater export market will have to be developed if increased capacities in the east are to be utilized.

At the business meeting of the association, J. Ledie Miller, assistant chief combustion engineer for Republic Steel Corp., was elected president of AISE for the coming year, his term starting in January. Mr. Miller succeeds C. L. McGranahan, assistant general superintendent of the Pittsburgh Works, Jones & Laughlin Steel Corp., who is president of the association during the current calendar year. Succeeding Mr. Miller as first vice-president of AISE is J. S. Murray, chief electrical engineer, Follansbee Steel Corp., Follansbee, W. Va.

The first winner of what will be the annual Kelly award was Andrew J. Fisher, fuel engineer, Bethlehem Steel Co., Sparrows Point, Md., for his paper, "The Relation of Flame Character to Open Hearth Operation." The Kelly award was inaugurated this year as an annual presentation by the association in memory of the work and achievements of the late John F. Kelly, first managing director of the association. It will be annually awarded for the paper that is judged by the association to be of greatest value to the industry, and the award is not confined to AISE members.

Technical sessions of the annual meeting were well attended, with the six engineering divisions of the association holding nine technical sessions covering about 28 main topics.

Among the papers attracting most interest was that concerning the development by the United Engineering & Foundry Co., of the Unitemper mill. This mill is a stretch tempering mill for sheet and strip, and the only one built has been in operation at the Republic Steel Corp.'s Niles, Ohio, plant. The mill was designed in answer to the perennial requests of can manufacturers for a tinplate of greater temper hardness combined with satisfactory ductility and flatness for fabrication. However, because all angles concerning patents have not been cleared up, a complete description of this development is being withheld. M. D. Stone, manager of the development department of United, read the paper.

Paul R. Sidler, electrical engineer of Brown, Boveri & Co., Ltd., New York, discussed "Gas Turbines for Blast Furnace Blowers," showing how the application of this old prime mover that has recently come up for considerable attention has progressed during the past 40 years. He pointed out that the development has been held up by the need for an efficient air compressor.

However, based on results of development work done in the field of applying the gas turbine to blast furnace blower operation, Mr. Sidler pointed out that advantages of the gas turbine plant over steam turbine driven units can be obtained without

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ANDREW J. FISHER (right), fuel engineer, Bethlehem Steel Co., Sparrows Point, Md., is being presented here with the first annual Kelly award by AISE president, C. L. McGranahan. He won this award for his paper "The Relation of Flame Character to Open Hearth Operation."

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# Sacrificing Employment for Price . . .

sacrificing any of the reliability that has been accepted standard in steam turbine plants.

When the War Production Board was seeking ways and means of expanding steel capacity as quickly as possible, sintering plants were proposed at various locations throughout the country. These plants, designed to produce some 10,771,000 tons of sinter annually, would increase the existing pig iron capacity by approximately 851,000 net tons annually, equivalent to about two additional blast furnaces.

Republic Steel Corp. was called upon to build five sintering plants for the Defense Plant Corp., having a total capacity of about 2,189,000 tons per year. C. J. Duby, chief engineer, Warren District, Republic Steel Corp., told attendants of the Operating Practice Division of the AISE of the "Design and Operation of Modern Sintering Plants," confining the bulk of the discussion to the Republic unit constructed at Warren, Ohio.

In a symposium discussion on "Cleaning of Steel for Subsequent Coating," N. E. Cook, general superintendent of galvanizing, Wheeling Steel Corp., Wheeling; Joseph J. Duffy, Jr., development and service engineer, Pennsylvania Salt Mfg. Co., Philadelphia; and Joseph Greenberger and Lane Johnson, Jr., development department, United Engineering & Foundry Co., Pittsburgh, discussed the various phases of this subject.

Abstracts of these papers, as well as the ones previously described, are included in the following report on the sessions.

## The Unitemper Mill

THE first major development for the postwar steelmaking era, a rolling mill of radical design to be used in finishing a strip product that will have higher qualities demanded of the steel companies by the consumers in recent years, was described by M. D. Stone, manager, development department, United Engineering & Foundry Co., Pittsburgh. This new mill, the Unitemper mill, tempers strip and sheet in coil form by stretching beyond the yield point of the metal to obtain the desired temper, hardness and ductility, operating at speeds between 2500 and 3000 ft. per min.

The Unitemper mill will be utilized not only for tinplate, for which the development work was originally undertaken, but will also be used in tempering auto body sheets, furniture sheets, stainless steel panels and other strip mill items.

Previously, temper pass mills were built heavier and stronger to withstand rolling loads sometimes higher than those encountered in rolling for reduction of gage in cold strip mills. United research, as a result, was aimed at development of a temper mill at lower cost and more economical operation, that would combine extreme hardness with an exceptionally high degree of ductility in the product. These aims, through the development of the Unitemper mill, were accomplished. The mill appears to be a conventional four-high mill, but operates on an entirely different principle. Because patent applications have not been completely cleared up, a complete description of the mill itself must be withheld at this time. This mill will, however, be described in THE IRON AGE within the next few months.

## Gas Turbines for Blast Furnace Blowers

WORK on gas turbine schemes has been carried on by many engineers in various countries since the beginning of this century, according to Paul R. Sidler, electrical engineer, Brown, Boveri & Co., Ltd., New York. From the beginning it was recognized that the success or failure of a gas turbine set is closely related to the characteristics of its air compressor, particularly to its power consumption or efficiency. Early attempts had no practical results because the compressor absorbed all the energy which the gas turbine could produce.

Work on gas turbine problems was

THESE top executives of the Association of Iron and Steel Engineers attended the association's 40th annual convention in Pittsburgh, Sept. 25, 26 and 27. They are, left to right, J. Ledie Miller, assistant chief combustion engineer, Republic Steel Corp., Cleveland, who will be president of AISE next year. C. L. McGranahan, assistant superintendent of the Jones & Laughlin Steel Corp.'s Pittsburgh Works, is the president this year. The first vice-president of AISE next year will be J. S. Murray, chief electrical engineer, Follansbee Steel Corp., Follansbee, W. Va.

thus for a long time largely concerned with the development of an efficient air compressor or blower. It is of interest to note that the world's first practical centrifugal compressor was built by Brown Boveri in 1906 for use with a gas turbine project pursued in France. This particular application of the centrifugal machine was not a success, but there were many interesting uses in other fields, notably as blast furnace blowers, driven by steam turbines. Fourteen turboblower sets manufactured by Brown Boveri were installed in European steel mills between 1906 and 1910, five sets also in the western hemisphere, in Canada and in Chile. A few years later the first American built centrifugal blast furnace blowers began to appear.

In adapting the basic gas turbine to blast furnace application, it is necessary merely to omit the generator and its gear and to devise an extraction pipe around the middle of the axial compressor from which the blast air is tapped. It is also desirable to connect an axial blower for the furnace gas fuel to the same set through a suitable gear. The total air volume handled in the axial compressor is made up of the blast air, tapped at about 30 to 35 lb. per sq. in., the combustion air and the cooling air, both compressed to 60 lb. per sq. in. gage. This total is 2.2 to 3 times as large as the blast volume alone. Even a variation of the blast volume from maximum value to zero will, therefore, reduce the total air volume only from 100 to about 53 per cent in the extreme case. The conditions imposed upon the governing devices will thus be substantially less exacting than in the case of the centrifugal machines with steam turbine drive where small fractional volumes may be required.

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FIG. 1 — The pressure-volume curves of centrifugal and axial compressors for constant speed, and their adiabatic efficiency.

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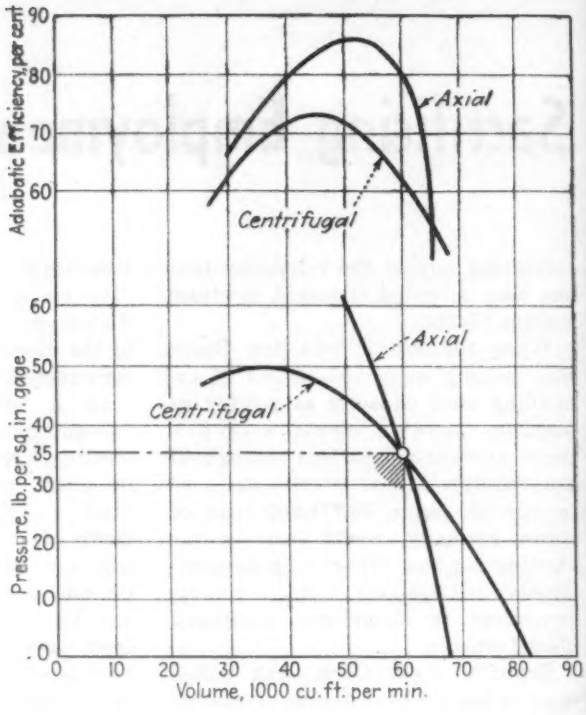



The products of combustion pass directly through the gas turbine. In order to avoid any corrosion in the blading it is necessary that the blast furnace gas be dry and cleaned to a maximum dust content of 0.013 grain per cu. ft. While the experience with Velox boilers burning blast furnace gas has shown this limit to be adequate for continued service over many years, a still higher degree of cleanliness provides even greater safety. Most plants use also blast furnace gas for heating coke ovens and therefore have equipment for keeping the cleanliness below 0.01 grain. In such a case it will naturally be desirable to use the same gas for the combustion chamber.

A heat exchanger is also used in the gas path after the turbine, using some of the heat content to raise the temperature of the combustion air and of the fuel gas. The thermal efficiency of the plant increases in direct proportion to the surface of this heat exchanger. A limit is, however, imposed by the practical considerations of cost and space requirement in comparison to the gain in heat economy.

Fig. 1 shows the pressure-volume curves of centrifugal and axial compressors for constant speed and their adiabatic efficiency. The pressure-volume curve of the axial machine is much steeper than that of the centrifugal compressor, that is, the pressure drops more rapidly when the volume increases. Since standard American operating practice requires regulation for constant volume while the pressure may be varied to meet changing blast furnace conditions, the very steepness of the curve enables the axial compressor to hold the volume close to the desired value over a wider pressure range. To put it differently, the governing devices will not have to operate so frequently or for so long a period to keep constant volume as in the case of a centrifugal machine. As the elements of the governing system are the same for both compressor types, this results in quicker response of the axial machine.

With both machine types the steam

TABLE I

| Item | Figure 2 | | | Figure 3 |
|---|---|---|---|---|
| | Plant A | Plant B | Plant C | Plant D |
| 1. Blast volume, cu. ft. per min. | 47,000 | 47,000 | 47,000 | 53,300 |
| 2. Blast pressure, lb. | 17 | 17 | 17 | 17 |
| 3. Turbine output, kw. | 2,970 | 2,970 | 2,720* | 2,700* |
| 4. Efficiency of compressor, per cent | 75.5 | 75.5 | 82.5 | 82.5 |
| 5. Hot blast temperature, deg. F. | 1,380 | 1,380 | 1,380 | 1,472 |
| 6. Heat consumption per cu. ft. of blast air (with hot blast stoves) B.t.u. | 48 | 46.6 | 46.6 | ..... |
| 7. Heat consumption per cu. ft. of blast air (with steel blast heater), B.t.u. | 45.7 | 44.3 | 44.3 | 37 |
| 8. Total enclosed building space for power plant, cu. ft. | 233,000 | 100,000 | 60,000 | 112,000** |
| 9. Cost of complete power plant, without buildings and foundations, per cent | 100 | 80 | 75 | 115** |

* Power output for blast compression only.
** Includes steel blast heater.

or gas turbine drive allows easy speed variation over a wide range. The fact that the axial compressor does not require speed reduction down to zero volume—since no blast delivery means a reduction of the total volume down to about 53 per cent only—has already been noted. This feature again puts the axial compressor in a more favorable position as regards governing range. In addition, the combination of gas turbine and axial compressor is easily adapted to blow-off or by-pass regulation with good efficiency, whereby any surplus air volume is led back into the gas turbine at a suitable pressure stage and helps to develop driving power. Also in this respect, the gas turbine driven axial blast furnace blower is much more flexible than the steam turbine driven centrifugal compressor.

Both types of compressor have a multitude of pressure-volume curves, one for each speed. The normal operating point, corresponding to 100 per cent blast volume and 100 per cent blast pressure—also 100 per cent speed—must not be too close to the pumping limit, in order to allow for the usual wide variations in operating conditions.

For normal operating conditions it is sufficient to obtain an increase in the blast volume by about 25 per cent with or without a corresponding pressure rise. In case of a hanging charge, the blast pressure is usually increased by about 50 per cent, preferably without substantial reduction in the volume. Here again the steeper characteristic of the axial compressor will enable it to reach the desired operating point in shorter time and with less demand on the governing devices.

When comparing the characteristics of centrifugal and axial blast furnace blowers, it has already been noted that the governing system employs the same elements in both cases. In accordance with standard Brown Boveri practice for all turbo-machinery, the governing devices and all lubrication points are fed from a common pressure oil system through a main oil pump gear-driven from the main shaft. A motor-driven auxiliary pump provides oil pressure during starting and shut-down periods.

The main governing element is the speed regulator in which a centrifugal governor controls the passage of pressure oil in accordance with the speed of the blower set. This variable oil pressure acts upon the bypass valve for the fuel gas and thereby changes the fuel supply to the combustion chamber. A governor is provided to obtain constant blast volume or, if desirable, constant blast pressure. In this case the speed governor is set for the maximum speed of the unit reached in normal operation. It will thus only act when the set reaches its maximum permissible speed to prevent tripping and shutting down by the overspeed governor.

The volume governor is of the same design as usually furnished for centrifugal machines, with a membrane deflected by the pressure differential across an orifice plate. It is connected to the delivery side of the blower, that is, the outlet for blast air. This is necessary because at the suction side the air volume is made up of the blast, the combustion, and the cooling air.

The arrangement with volume governor connected to the delivery side was adopted with complete success on most of the centrifugal blast furnace blowers which Brown Boveri furnished for installation in the United States and other countries. In some cases difficulties seemed to arise through the necessity of finding a sufficiently long straight pipe section in the delivery main in which to install the orifice. By a special design of orifice grid which produces the same effect as a straight pipe section, this difficulty could always be eliminated.

In order to obtain stable operation also with volumes smaller than the "natural" pumping limit, the bypass connection between the blower delivery and the gas turbine has been provided. A check-valve in this line is so adjusted that it opens just before the pumping limit is reached and allows the surplus air—not wanted in the blast line—to flow to a suitable stage in the gas turbine where it helps to furnish driving power.

By this method, however, it is not possible to reduce the blast volume down to zero while the blower is running at normal speed. For this purpose an additional oil-operated blow-off valve is provided, which comes into action when the check-valve is fully opened.

Among the customary safety de-

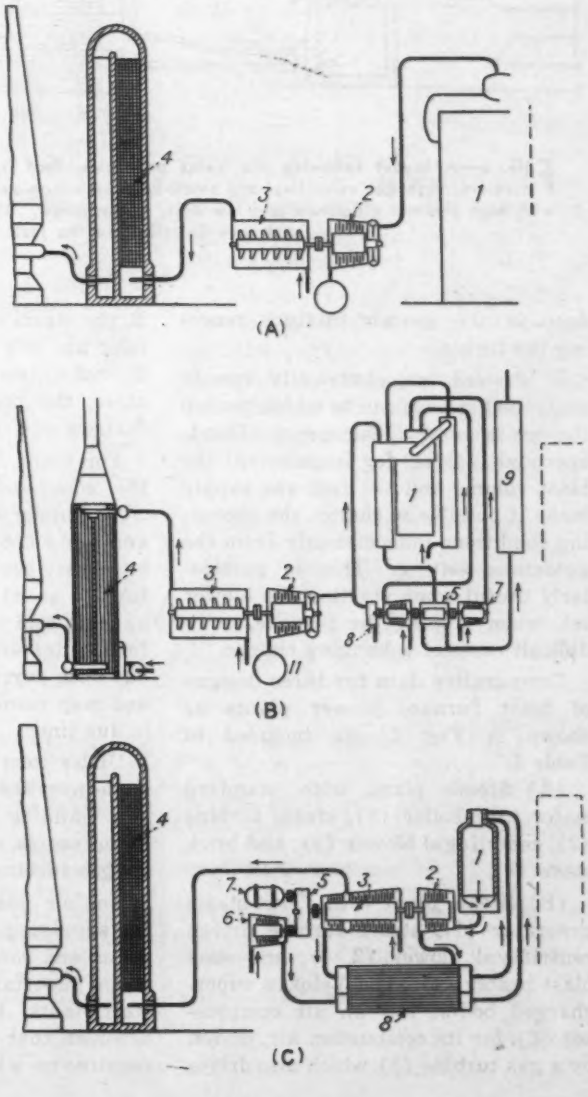



FIG. 2 — Three designs of blast furnace blower plants are shown here. Comparative data on these three plants are listed in Table I.

vices, an overspeed governor is provided. It is adjusted for 10 per cent overspeed and eliminates the governing oil pressure, thereby causing the fuel bypass valve to open fully and the fuel stop valve to close. In this manner, the fuel supply to the combustion chamber is stopped immediately and the set slows down due to lack of hot driving gas. A thermostat operates when the combustion gas temperature becomes too high and, if sustained, would endanger the turbine. It acts upon a valve in the blast line and reduces the blast volume. This results in a larger combustion air volume and a consequent temperature drop in the gas:air mixture reaching the turbine.

If desired, an electrically remote controlled release can be added to stop the set in case of emergency. Hand-operated valves for regulating the blast volume and the fuel gas supply make it possible to change the operating conditions independently from the automatic setting. This is particularly useful when starting the blower set, when tapping the furnace, or in difficult cases of a hanging charge.

Comparative data for three designs of blast furnace blower plants as shown in Fig. 2, are included in Table I.

(A) Steam plant with standard water tube boiler (1), steam turbine (2), centrifugal blower (3), and brick stove (4).

(B) Steam plant with Velox steam generator (1), steam turbine driven centrifugal blower (2, 3), and steel blast heater (4). The Velox, a supercharged boiler, has an air compressor (6) for its combustion air, driven by a gas turbine (5) which also drives fuel gas compressor (7). On the same shaft is a starting steam turbine (8) also used for initiating load changes. (9) is the economizer.

(C) Gas turbine plant with a combustion chamber (1), gas turbine (2), axial air blower (3), brick stove (4), gear (5), axial blower for fuel gas (6), starting motor (7), and heat exchanger for air and fuel gas (8).

In plant B, a steel blast heater was provided in the actual plant under comparison. The accompanying table gives some of the main data of all three plants, adjusted for the same blast conditions, which were not the same in the plants built. For A and B, the steam conditions at the turbine inlet are 483 lb. per sq. in., 750 deg. F., total temperature. In all three cases, the heat content of the blast furnace gas is 102 B.t.u. per cu. ft.

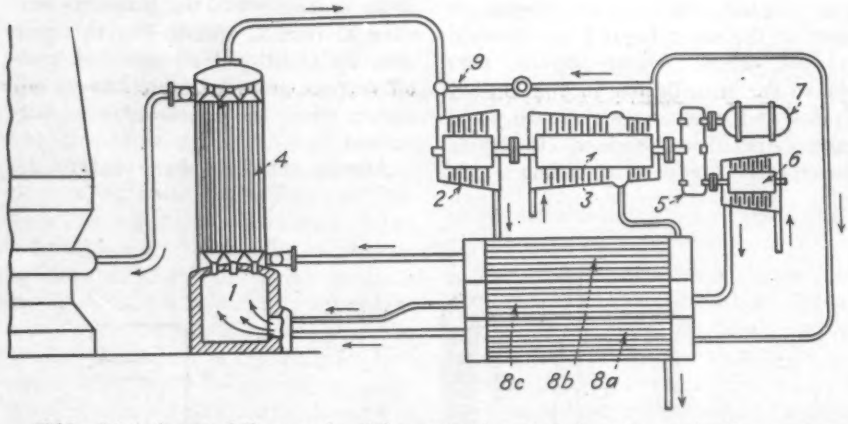



FIG. 3—A layout following the Velox principles, that is, with combustion under pressure, high gas velocities, and small heat exchange surfaces in a reduced area with high thermal efficiency and low cost, is illustrated. The individually numbered parts are described in the text.

For plant A, the space and cost of the coal-handling equipment is included under items 8 and 9. Plants B and C do not include this equipment, as neither the Velox boiler nor the gas turbine is at present developed for burning coal even in finely pulverized form. Research work on coal firing has been carried on for several years and may result in a practical solution in due time.

Under item 8, no attempt has been made to translate space requirements into building costs. With the large difference in space the advantage of the gas turbine plant C is noticeable.

Neither plant includes provisions for supplying and treating water for steam and condensation although this is an important cost factor in many steel plants. It must be remembered, however, that the gas turbine plant C requires no water.

Designing a steel blast heater along Velox principles established during many years of experience, that is, with combustion under pressure, high gas velocities and consequently smaller heat exchange surfaces results in a substantially reduced space, high thermal efficiancy, and low cost. With the heating surface reduced to only a fraction of that found in heaters having atmospheric combustion, it becomes economical to allow for replacement of the heating tubes in relatively short intervals.

A layout following these principles is shown in Fig. 3, with individual parts designated as follows:

1. Combustion chamber.
2. Gas turbine.
3. Axial compressor.
4. Hot blast heater (higher temperature range).
5. Reduction gear.
6. Axial compressor for fuel gas.
7. Starting motor.
8a. Heat exchanger for combustion air.
8b. Heat exchanger for fuel gas.
8c. Heat exchanger for blast (lower temperature range).
9. Bypass line to regulate gas inlet temperature to turbine.

Data on a definite project worked out for a blast volume of 53,500 cu. ft. per min. and a maximum blast temperature of 1472 deg. F. have been added in Table I under column D. It should be particularly noted that in this case the supercharged steel blast heater is included in the total space—although it would probably still be located outdoors—and the comparative cost of the complete plant. In columns A, B and C, the stove or blast heater is not included under items 8 and 9. This unbalance could not be avoided, as the blast heater forms an integral part of the power unit and cannot be segregated in preferred arrangements. It is of interest to consider that a complete plant including steel blast heater will cost only about 15 per cent more than the power plant with water tube boiler and steam turbine driven centrifugal blast blower, but not including the several brick stoves and their piping.

The layout of a gas turbine driven blast furnace blower worked out for the practical conditions in a large American steel plant was illustrated by the author. The nominal blast rating is 60,000 cu. ft. per min. at 19 to 30 lb. per sq. in, but with the provisions to go to 75,000 cu. ft. per min. and 35 lb. per sq. in.

In this specific case for 60,000 cu. ft. per min. blast volume, the axial blower handles a total suction volume of 132,000 cu. ft. per min. If units with larger blast volume are taken into consideration, the total volume to be handled by the blower naturally also increases in about the same pro-

portion. One might then encounter certain complications in design and will probably find it preferable to produce the total air volume in two separate blower housings. Seeing that the blast volume alone is somewhat less than half of the total, the simplest solution is then to provide one blower for the blast and another for the combustion and cooling air, both coupled together.

Already for 75,000 cu. ft. per min. rated blast volume, this arrangement has certain advantages and more so when still larger volumes are considered. Providing two separate blowers naturally increases the axial length of the set, but does not necessarily affect the building length in the same degree.

The gas turbine sets operating in Switzerland and other countries of Europe have not been in continuous day-and-night operation and have therefore not accumulated as many operating hours as would otherwise have been expected. The record of the Neuchatel 4000 kw. set, which has been operated intermittently for 4½ years; that of the Swiss gas turbine locomotive which meanwhile covered over 50,000 miles, representing about 3000 hr. for its power plant; and the somewhat scanty data collected from other gas turbine sets, permit definite conclusions as to the life expectancy of individual parts and the amount of maintenance required at regular intervals.

It should be recalled that the three main elements of the present gas turbine power unit, the gas turbine proper, the axial compressor, and the pressure combustion chamber, have been in regular service in the Velox steam generator since 1930 and in Houdry gas turbine driven compressor sets since the end of 1936. The temperature conditions in these applications, especially as regards the gas turbine blading, are closely similar to those encountered in the gas turbine driven blast furnace blower. The pressure is somewhat lower—35 to 45 lb. per sq. in. gage instead of 60—but again not too different for valid conclusions.

Several Velox units installed from 1931 to 1934 have meanwhile completed 70,000 hours of operation, many others following with 50,000 and 30,000 hr., whereby the gas turbine still retains its original blading. All the other parts of these charging sets needed no major replacements either, but merely annual inspections, occasional replacements of labyrinth strips and oil changes.

Based on this record, it can be definitely asserted that Brown Boveri gas turbine driven blast furnace blowers require no more replacements or maintenance than is customary for any steam turbine driven centrifugal unit. The advantages of the gas turbine plant can therefore be obtained without sacrificing any of the reliability that has for years been the accepted standard in steam turbine plants.

It is believed therefore that the operators of blast furnace plants will wish to give serious consideration to these advantages for replacements as well as extensions of existing furnace installations.

## Design and Operation of Modern Sintering Plants

DURING the period that the capacity of the steel industry was being expanded to meet the needs of war production, Republic Steel Corp. was called upon to build five sintering plants for the DPC, having a total rated capacity of 2,189,000 net tons per year, it was pointed out by C. J. Duby, chief engineer, Warren District, Republic Steel Corp. These plants were to be located in the districts and designed to sinter local materials, with capacities as shown in Table II.

The type of sintering machine decided upon for these installations was the continuous pallet conveyor with ignition furnace over the bed. It was found that various ores and ores of various screened sizes have definite sintering characteristics, and these facts were considered in determining the square feet of effective wind box area and the size, type and capacity of the suction fan required for the individual plants to meet local conditions.

Wind boxes, down legs, collecting mains, dust catchers and dampers were designed to assure the minimum of resistance and turbulence to the flow of the waste gases. The dust catcher or settling chamber was designed with a generous factor and should prove very effective and operate with very little attention and maintenance cost. All of these new sintering plants have the same basic design mechanically. However, due to their particular locations in the various districts and the existing methods that were at hand for handling raw materials, special consideration had to be given to the raw material conveying system, as well as the storage bins, track hoppers, screening equipment, and also the discharge of the finished sinter and subsequent handling.

The ores from the Port Henry mine lend themselves admirably to concentration and sintering to produce excellent open hearth charge ore and blast furnace sinter. Past experience has proved that by charging sinter in the blast furnace burden to as much as 40 to 45 per cent of the metallic charge, pig iron production could be raised from 10 to 19 per cent, coke consumption decreased approximately 15 per cent, flux lowered approximately 20 per cent, and flue dust production cut down as much as 50 per cent. These figures, of course, are only approximate and vary with the different furnaces.

A continuous pallet conveyor type sintering plan has been in successful operation at the Corrigan-McKinney Plant of the Republic Steel Corp., Cleveland, for a number of years. This plant was used as a guide in designing the five new sintering plants for the corporation.

(TO BE CONTINUED IN THE NEXT ISSUE)

**TABLE II**

*Sintering Plants Erected by the Republic Steel Corp. for DPC*

| Location | Equipment | Materials Handled | Capacity, Net Tons |
|---|---|---|---|
| Spaulding, Ala. | 1 Machine<br>16 Wind Boxes | Hematite Concentrates and Flue Dust | 350,000 |
| Port Henry, N. Y. | 2 Machines<br>14 Wind Boxes Each | Magnetite Concentrates | 765,000 |
| Warren, Ohio | 1 Machine<br>12 Wind Boxes | Screened Ore and Flue Dust | 382,000 |
| Youngstown, Ohio | 1 Machine<br>12 Wind Boxes | Screened Ore and Flue Dust | 392,000 |
| Chicago | 1 Machine<br>12 Wind Boxes | Screened Ore and Flue Dust | 300,000 |
| | Total | | 2,189,000 |

# New Equipment . . .

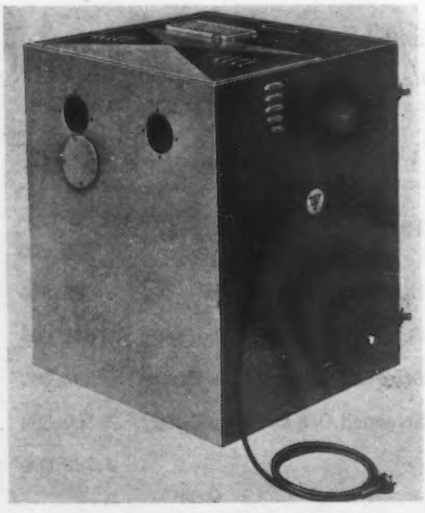
## Plant Service

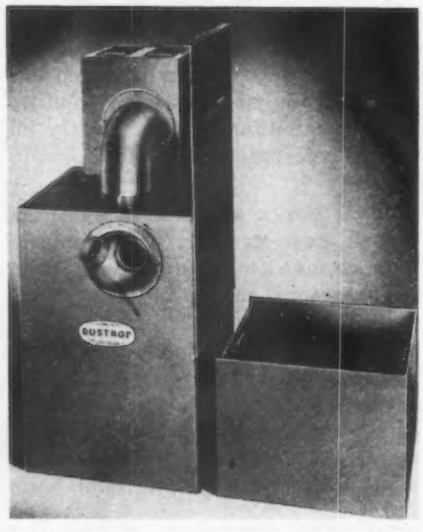
***. . . Recent developments in auxiliary equipment for the metal working shop are described in the following pages.***

PORTABLE electric unit heaters which were developed initially for use in control and generator rooms for a number of TVA power stations have been announced by *Electric Air Heater Co.*, Mishawaka, Ind. An 18 kw. capacity heater complete with control and 50 ft. of rubber-covered cable and connector is illustrated. The heating elements used are of standard patented Electromode construction with sheathed resistor sealed in a one-piece finned aluminum casting. The motor-driven fan is mounted directly behind the elements.

### Dust Collector

DESIGNED for use with an individual machine used in grinding, polishing, buffing, sanding or any similar operation, a dust collector has been developed by *Delta Mfg. Co.*, 620 E. Vienna Avenue, Milwaukee 1. The collector is provided with special fittings permitting its attachment to any one of several Delta-Milwaukee machine tools. The collector is activated by a powerful fan which sucks both fine and heavy dust and small particles through an air filter. The larger particles fall into a removable pan at the bottom. The filter is a permanent cleanable one with low air resistance and is completely fireproof. A woven glass filter is also available for use in collecting "flour fine" dust. The fan moves 350 cu. ft. of air per min., developing a static suction of 3 to 4 in. Power is furnished by a 1/3 hp. motor.






### Dust Collector

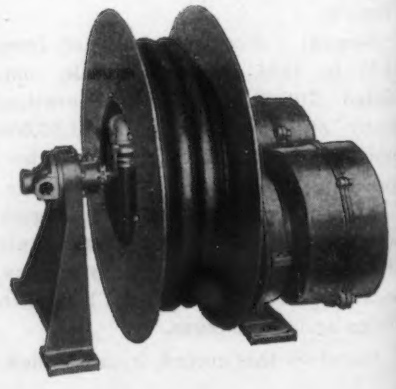
A PRE-CLEANER unit used in conjunction with Model 600 Dustkop dust collectors has been added to its line of industrial dust collectors by *Aget-Detroit Co.*, 602 First National Bank Building, Ann Arbor, Mich. It can be supplied with the Dustkop power unit, illustrated, or separately. Installation is accomplished by connecting the inlet flange sleeve of the pre-cleaner to the outlet of the dust source. Practically all of the sawdust, dirt, shavings, lint, etc., drawn in from the source are separated out of the air stream by the pre-cleaner. The air is then drawn through the multi-blade fan in the Dustkop and returned to working space after passing through a spun glass filter which forms the top of the Dustkop dust collector.

### Water Heater

A STEAM mixer water heater, a packaged unit including heater, temperature regulator, temperature-pressure relief valve, thermometer and, where necessary or desired, water pressure regulator and steam and water pressure gages has been announced by *O'Brien Steam Specialty Co.*, 205 Harrison Street, Syracuse 2, N. Y. The heater employs a muffler-diffuser type mixing nozzle. All the heat of the steam is delivered to the water and the condensate itself is used as hot water. The unit is designed for steam pressures from 50 to 150 lb. steam pipe sizes range from ½ to 1½ in. with capacities ranging up to 5500 gal. per hr. There is also a wide selection of temperature ranges available, making the unit practical as either a primary or booster heater.

### Water Reel

A HEAVY-DUTY water reel built to accommodate 50 ft. of 1 in. i.d. x 1⅝ in. water hose for use on special machinery has been announced by *Appleton Electric Co.*, 1701-41 Wellington Avenue, Chicago. The reel is powered by motor springs similar to those used on the type EG reel.



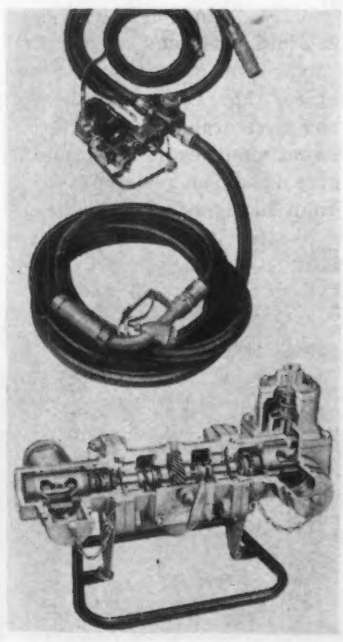
Two springs work in series and two units work in parallel providing the power for hose take-up. Spring power is transmitted through machine gears to the drum shaft. The swing joint has an internal ball bearing furnished with stainless steel balls to prevent corrosion from the passage of water during continuous service. A 1-in. pipe inlet fastened directly to the supporting bracket may be mounted at any 90 deg. position.

### Electric Power Grease Gun

AN electric portable power grease gun, Model 7190, the latest addition to the Alemite line of industrial equipment, has been announced by the *Alemite Div.* of *Stewart Warner Corp.* Developed to deliver fast, positive high pressure lubrication with all types of lubricants that seek their own level, the gun is equipped with large heavy duty wheels for mobility. Operation is facilitated by means of a ball bearing front caster in the steering mechanism. A quiet driving device connects the heavy duty 1/3 hp. electric motor to a high pressure grease piston and cylinder fitted to close limits to prevent by-passing. A mercury switch automatically shuts off the motor when 5000 lb. pressure has been built up in the delivery hose. The equipment includes a 12 ft. electric cord, a 6 ft. 20,000 lb. burst pressure hose and control valve with hydraulic coupling, combination handle and cord and hose rack.

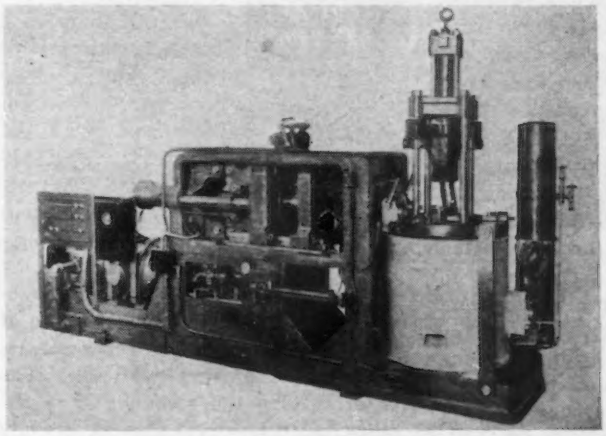
### Bilge and Refueling Pump

A PORTABLE electric-driven bilge and refueling pump, illustrated, has been announced by the *Romec Pump Co.*, 107 Abbey Road, Elyria, Ohio. The unit handles liquids at the rate of 1500 gal. per hr. or more from its reloading pump and 840 gph. from its bilge pump. Both pumps are operated by a General Electric motor. The pump is equipped with a 10 ft. suction hose and a 30 ft. discharge hose. The inside diameter is 1¼ in. An engine driven fuel pump which delivers 400 gal. per hr. at 2500 r.p.m. is also being marketed by the company.



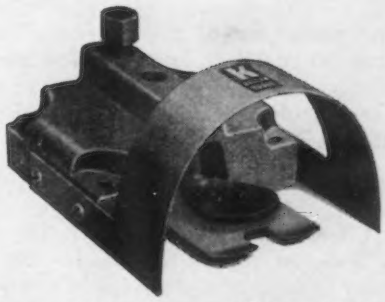
### Die Casting Machines

DESIGNED for high production of smaller castings, two-high-speed, high-pressure die casting machines, one for zinc, tin and lead alloys and the other for aluminum, brass and magnesium alloys have been developed by *Lester Engineering Co.* for *Lester-Phoenix Inc.*, 2711 Church Avenue, Cleveland. The zinc machine which has a submerged plunger and gooseneck system runs at 750 cycle per hr. without load and in actual operation makes 400 to 500 shot per hr. depending upon the size of the casting and its rate of chilling. On the aluminum machine, which has a cold chamber injection system, injection pressures up to 20,000 lb. per sq. in. are available. Features of both machines include a heavy beam-type frame of one-piece alloy steel whose beams have a cross sectional area of 78 sq. in. for holding dies shut, a double-toggle die locking mechanism built into the frame which is actuated by a hydraulic cylinder, a large centrally located Acme thread screw for die height adjustment actuated by a single hand crank and three automatic timers which control die movement cycle and metal injection cycle.



### Foot Valve

A COMPRESSED foot valve for use with air tools, air cylinders, air chucks, flash welders, forging machines, die casting machines, riveting machines, air vises and all other air operated equipment has been announced by *Keller Tool Co.*, Grand Haven, Mich. The foot valve comes in locking and non-locking types. A simple adjustment of the lever locking device prevents engagement of the operating pedal and changes the locking type to the non-locking type.



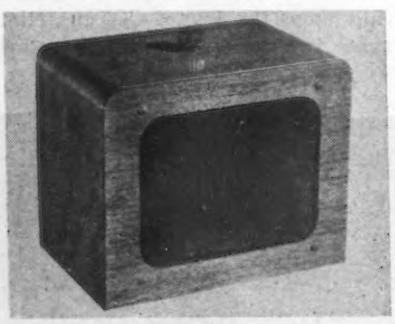
### $CO_2$ Fire Extinguisher

A 25-lb wheel-type $CO_2$ fire extinguisher for large area fire fighting has been announced by *Randolph Laboratories, Inc.*, 8 East Kinzie Street, Chicago. A palm-trigger valve is mounted on the extinguisher steel handle. By grasping the handle, the operator can move the unit and press the release button with one hand, discharging a penetrating, icy blanket of $CO_2$ in a large, sweeping arc, 10 to 20 ft. Release of the pressure on the palm-trigger automatically stops the flow of $CO_2$ gas, eliminates twisting of valves and retains

the remainder of the charge. The long range 5¾ ft. horn-and-hose connection directs a full charge into the base of the flames but keeps the operator at a safe distance.

### Oil Clarifiers

AS additions to its standard line of self-contained automatic recirculating clarifiers, *Briggs Clarifier Co.*, Washington, has brought out the DFR, the DR, the DRU and the G & F series. The DFR models have been added to provide flow capacities which range up to 500 gal. per hr. in round tank oil fuel oil filters for diesel engines. The DR series are designed to meet the need for an efficient line of oil filters for by-pass installation. Each unit is equipped with a precision-built relief valve set to maintain the most efficient operating pressure inside the clarifier and to allow circulation through the clarifier when the oil is cold. Flow capacities range from 1 to 20 gal. per min. The DRU series offer a completely self-contained unit with electrically operated pumps and heaters which operate independently of the engine or lubrication system and thus can be adapted to any engine. The series G clarifiers are small capacity units designed for oil filtration service on mobile, marine and light to medium duty stationary engines with a minimum flow capacity of 3 gal. per min. The series F clarifiers are designed for diesel and gasoline engines consuming from 5 to 10 gal. per hr.



### Sound Reproducer

A BAFFLE type reproducer unit used in Executone voice-paging and industrial music systems which provides duo-directional high fidelity reproduction of both voice and music for plant broadcasting has been announced by *Executone Corp.*, 415 Lexington Avenue, New York 17. The Model HF-6 speaker delivers 4 to 6 watt of output power and is recommended for wide-angle coverage of medium and low noise level areas. Use of several such units, properly spaced in large production areas, solves the problem of uneven sound distribution. A four-step volume control, with cutoff switch, provides for individual adjustment at each unit. A base compensation circuit progressively increases the bass response with each decrease in volume.

### Wet Flashlight Battery

A RECHARGEABLE wet flashlight battery for industrial use built on the principle of the automobile wet storage battery and especially valuable for operations where long continued and steady usage of flashlights is necessary, has been announced by *B. F. Goodrich Co.*, Akron, Ohio. The company claims that the wet storage batteries are more economical than dry cells when flashlight service is required in volume of where batteries require replacements more than once every two weeks. The batteries give the same light as the industrial type dry cells. A freshly charged wet battery will give about 3 hr. of constant light. Batteries can be used in the standard three or five cell dry battery case with the use of spacer plugs.

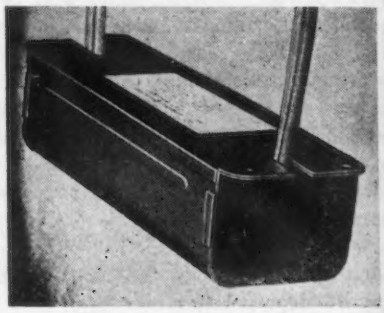
### Fluorescent Fixtures

A LINE of "Mitchelite" all steel fluorescent fixtures has been announced by *Mitchell Mfg. Co.*, 2525 Clybourn Avenue, Chicago. The units include 2-40 watt, 3-40 watt and 2-100 watt models with a choice of open or closed end reflectors in baked enamel or porcelain enamel finish. The "instant-start" feature is available on the

2-40 watt models. Wireway channels and reflectors are constructed of heavy gage steel. Units are finished in battleship gray.

### Two-Way Lead Ballasts

TWO-WAY-LEAD ballasts for the operation of Mazda F lamps have been announced by the *General Electric Co.*, Schenectady 5, N. Y. They



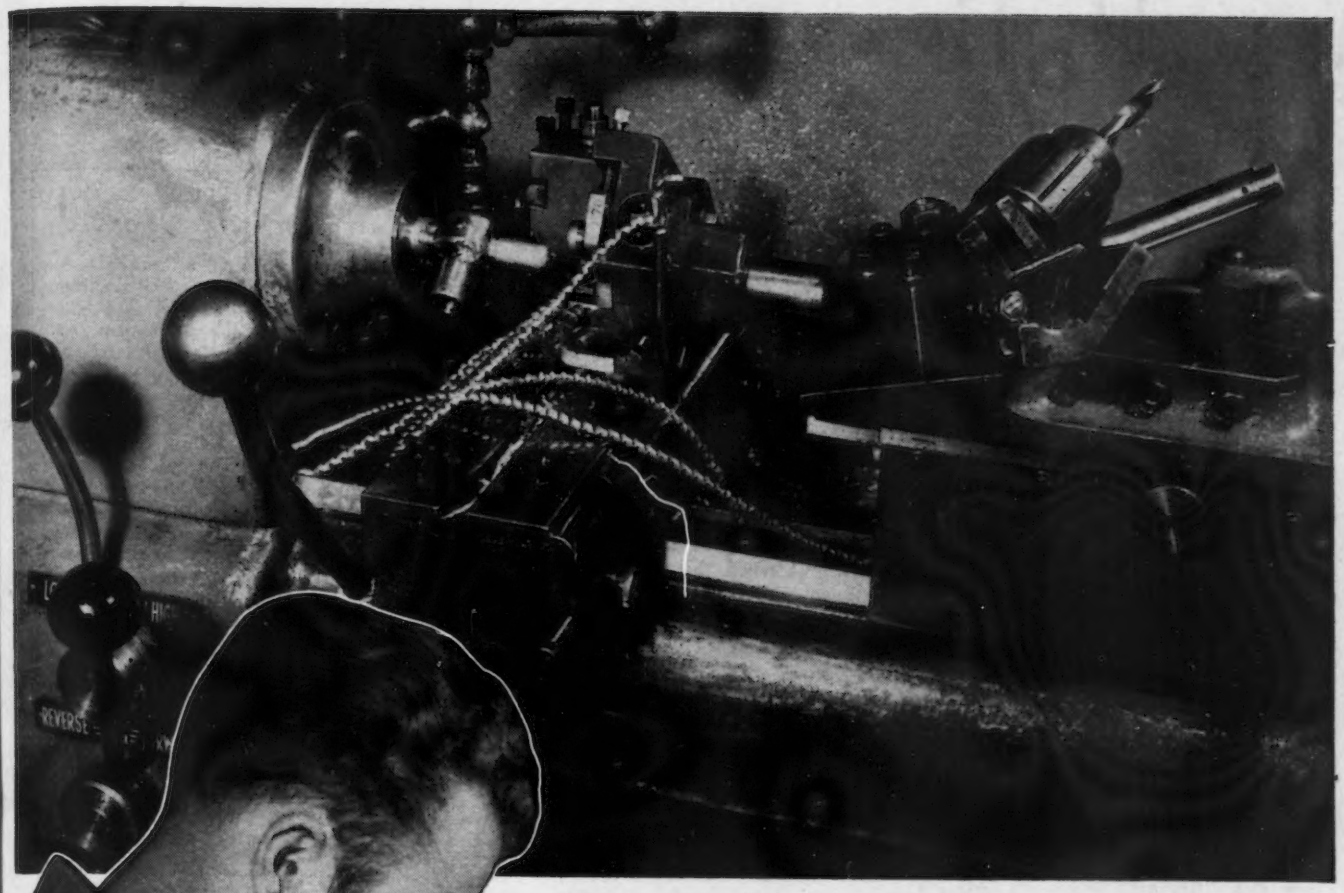
are available in the following ratings: Tulamps 30 and 40 watt, standard cross-section; Tulamp 40 watt, high voltage; Tulamp 100 watt; three lamp 40 watt and Forlamp 100 watt. With leads that can be brought out at either the ends or the bottom of the ballast cases, the ballasts are interchangeable and serve the same applications as both the superseded leads-out-the-end and leads-out-the-bottom ballasts of the same ratings.

### Ear Protector

A SEPCO noise-absorbing ear protector has been announced by *Industrial Products Co.*, 2820 N. Fourth Street, Philadelphia, Pa. It is said to absorb adequate proportion of "danger area" noise or about 30 to 55 decibels of sound. It provides additional protection to the ear canal against flying fragments of foreign material and can be worn with comfort. It is available in several sizes to fit all ear canals.

### Plasti-Goggle

AN Amcoweld plasti-goggle designed for protection against impact hazards has been announced by *Eastern Equipment Co., Inc.*, Willow Grove, Pa. Made of one piece clear Plexiglass, the lens area extends in an unbroken curve from temple to temple without corners or sharp bends. A one piece arch construction plus the inherent qualities of Plexiglass is said to give an impact resistance far greater than hardened glass. The goggles are spatter resistant and light in weight.



# HARDINGE means precision performance to the Aviation Industry

Top photograph: HARDINGE Second Operation Machine set up to drill, turn and undercut a 24 S.T. aluminum alloy casting held in a double shank fixture at North American Aviation, Inc.

Write for 16-page bulletin illustrating and describing all Hardinge precision products.

Bottom photograph: HARDINGE Tool Room Lathe turning a nose gear drag strut from 1" to 5/8" at Lockheed Aircraft Corporation.

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# Assembly Line . . . STANLEY H. BRAMS

**• It's top billing again for the Fisher Mystery after corporation papers are filed . . . Questions arise on circumstances of Fisher-G.M. parting . . . Auto industry puts on an amateur show for press writers.**

DETROIT — The Great Fisher Mystery, playing its ninth week on the automotive stage, drew new headlines this week on developments which may—or may not—be significant.

Fisher affairs burst into the limelight last Friday on word that the brothers had incorporated two companies in Delaware, Fisher Brothers, Inc., and Fisher Motor Car Co. Simultaneously it became known that the companies had filed papers in Michigan and Oregon seeking permission to operate in those states.

The corporate purpose of each company, stated identically, was: "To design, manufacture, assemble, distribute, sell, repair, import, export and deal in airplanes, automobiles, motor coaches, motor trucks, engines, bodies and any and all automotive products, passenger and commercial, powered or unpowered vehicles, trailers and/or semi-trailers for passenger and commercial purposes and all component parts thereof, and supplies, accessories and mechanical and electrical devices and equipment therefor, and/or to be appointed and to act as agents or representatives for manufacturers and others in the handling, distribution and sale of the products aforesaid or any of them."

This phraseology—strikingly reminiscent of that of General Motors—is obviously well beyond probable immediate intentions of the Fishers. Its broad scope is typical of corporate definitions intended to eliminate later need of amendment to widen operational scopes.

Actually, the organization of the two companies can be regarded as a precautionary measure as much as a declaration of intent. It would have been quite possible for some canny outsider to organize companies of those names and perhaps reap a payoff for his nuisance value.

This could be true. Equally obvious is the fact that even if it is true it probably serves to indicate the direction the Fishers will take in setting up their personal manufacturing operations. Little doubt exists in Detroit but what the Fishers will move into the auto manufacturing field.

At any rate, they continue to cloak their intentions most intriguingly. The list of officers of the Delaware company includes Frank C. Taylor as president, Walter Hoffman as vice-president and W. A. Hamlin as treasurer. None of these are identifiable as important factors in manufacturing operations of any sort related to the various Fisher interests. The company address, 120 Broadway, New York, has no listed telephone. Filing of permissive papers for a foreign corporation in Oregon adds another zestful side to the riddle: Why have the brothers chosen to single out Henry Kaiser's home territory from all the other possible sites of operation?

One thing can be said quite positively here. The Fishers will definitely not go into the automobile business by buying a General Motors division. General Motors does not intend to sell any of its facilities, unless they have become old, wornout and unable to produce net income. Equally unlikely, even if this presently firm GM policy did not exist, would be the chances of the company's disposing of property to a possibly menacing potential competitor.

THERE might be another reason, too. There must be considered the possibility that the Fishers did not leave General Motors operations in the mutually warm atmosphere stressed by them and the company alike.

It is not impossible to suppose that they had one viewpoint on company policies, typical of the manufacturing side of the business represented on the directorate, while the Eastern directors, interested largely in financial aspects, had another. Such a difference might have widened to the point where the Fisher withdrawal from active company management became practically a necessity.

This might explain why there has been such a notable lag from the Fisher offices in announcing future plans, or even getting started on them. It is generally understood in Detroit that the resignations of the brothers were agreed on six or eight weeks before they were made public in early August. So four months or so have passed since the course of action was determined. The inference of the continued emphasis that the brothers are still undecided about their industrial plans of activity after all this time is that their parting from General Motors caught them without a concrete determination of what they would do next, and hence was not entirely voluntary.

Obscurity of another sort held sway last week when a party of visiting newspaper and magazine writers toured Detroit plants and sat in a seminar discussion on reconversion with a number of top industry executives.

This press meeting aptly proved the statement made only two days earlier by public relationist Paul Garrett that "industry is notoriously inept at explaining itself." The auto officials intended to show the visitors, invited because they mold public opinion in Washington, New York and Chicago, how difficult it will be to reconvert and to impress on them the need for action now. About all the lesson the visitors took home with them was that reconversion is so complicated that the industry itself has no really clear or concerted idea how to do it. The an-

## *Red Slacks No Hazard*

**• • • Sex reared its head in a decision of the impartial umpire of the Ford Motor Co. and the United Auto Workers' Union.**

**Umpire Harry Shulman ruled that a girl worker was entitled to a half-hour's pay which she was docked for time lost in going to the personnel office on complaints that the color of her red slacks provided enough distraction in the shop to constitute a hazard.**

**Said the ruling: "It is common knowledge that wolves, unlike bulls, may be attracted by colors other than red and by various other enticements in the art and fit of female attire."**

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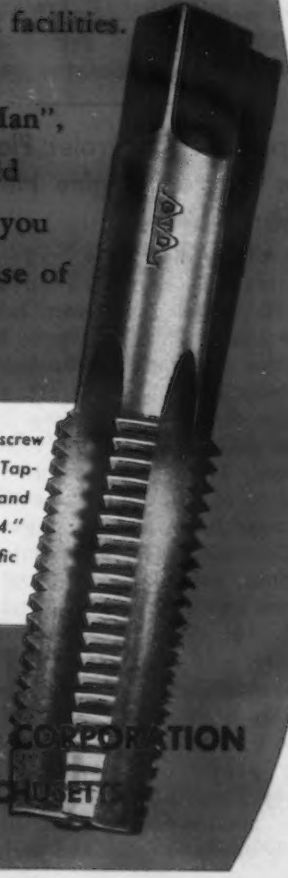

*Greenfield literature available on screw threading includes: "Facts About Tapping," "Choosing the Right Tap," and the new "Greenfield Catalog No. 44." Write for copies or any other specific information today.*

ARMY E NAVY

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swers to questions were bumbling. There was perhaps some slight excuse for that, because between the calling of the meeting and its occurrence the war situation had changed enough from its previously optimistic outlook so that reconversion was less popular a topic than it had been in early September; but if that excuse existed there was none for the holding of the meeting when it might have been postponed. As it worked out, it served largely to confuse influential writers who know little enough of industry's problems to begin with.

A FEW observations out of the meeting meanderings might be worthwhile: Chrysler's K. T. Keller held that reconversion unemployment will be much less than expected, evidently because there is so much work to be done. General Motors' C. E. Wilson called for: (1) Priorities rather than directives to produce machine tools needed after changeover; (2) unbinding of tool shops to handle retooling work; and (3) clarification of methods for clearing government inventory and equipment in privately-owned factories. Ford, Nash, G.M. and Packard agreed at that public hearing that reconversion, were it to start tomorrow, would take six to nine months; and they expected that if preliminary work could be done before a go-ahead on car production is given, time would be shortened to a normal model changeover period of three months or so.

## Expanded Chevrolet Plant For Aircraft Engine Heads

*Anderson, Ind.*

• • • Chevrolet Div. of General Motors has completed an extensive plant expansion program here in its new plant, which has gone into production of forged aluminum alloy cylinder heads for aircraft.

The expanded plant provides more than 55,000 ft. of additional floor space. These permit more intensive output of heads for R-2800-C, 18-cylinder P&W aircraft engines made in Chevrolet and other plants. These engines power bomber and fighter planes including the P-47 Thunderbolt and the P-61 Black Widow night fighter.

Approximately 350 machines, many of them new and specially designed, have been installed. The forged heads they produce are said to increase power output by 10 to 12 per cent over maximums of cast aluminum heads of similar size and design.

# Deny Auto Industry's Request For Immediate Machine Tool Priority

*Washington*

• • • The automobile industry's request for immediate priority on machine tools in order to give the industry a "fast start" on passenger cars after Germany's collapse was denied this week according to J. A. Krug, chairman of the War Production Board here.

Huge munitions schedules for the rest of the year was given as the reason for the denial. "If WPB did that for the automotive industry, we would have to do it for all industry," Mr. Krug explained adding that "we haven't the manpower now to make the machine tools."

The motor group proposed that its order for peacetime machine tools and equipment be given priority equal to the "less urgent" class of war orders and ahead of some of the consumer goods now given "essential civilian" priorities.

The WPB now permits plants to place orders for machines and tools to be needed after V-E Day, but motor executives have reported that they could not get delivery unless the orders had priority standing. It has been estimated that some of these supplies needed cannot be delivered until next June.

Preferential treatment, the automotive industry has estimated, would shorten the change-over period by three months. Manufacturers say that it will take six or eight months after V-E Day anyway to get production started.

## Machine Tool Orders Evidence No Pattern During Current Period

*Cleveland*

• • • Machine tool orders have been holding up well, but have been spotty in that large orders have been pretty well spaced out and during the interim periods orders have been for small quantities. There has been no particular pattern evidenced in the buying. That is, the orders that are coming in do not seem to be be particularly heavier for some types of equipment as against other types. The ordering is across the board on all units, so that no trend can be derived from the buying.

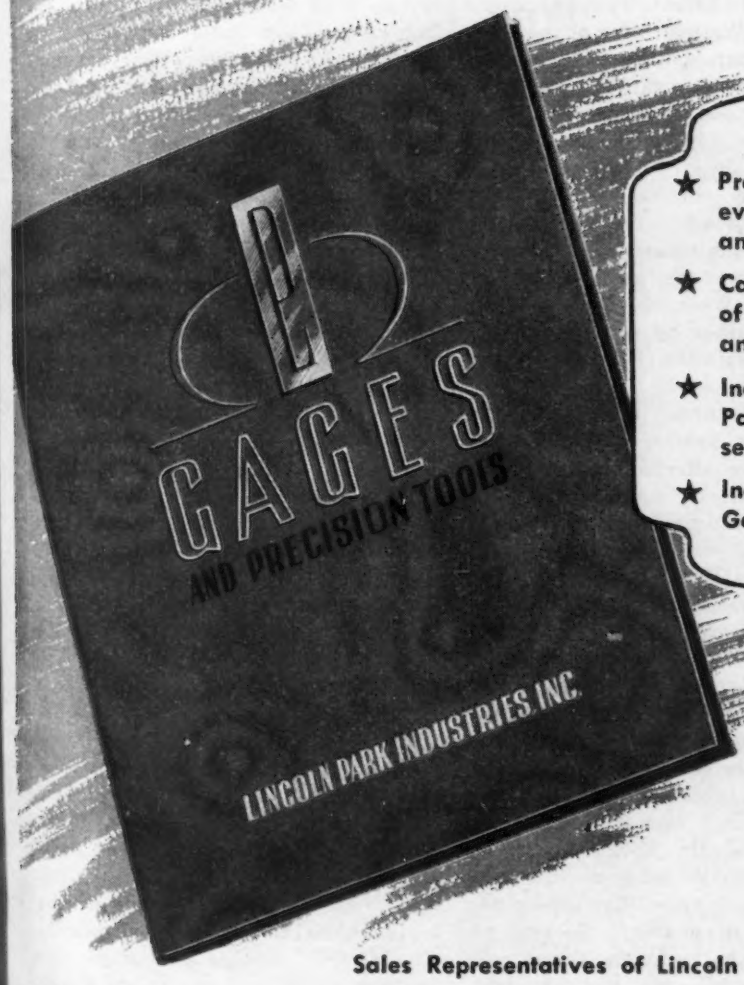
The heavy artillery shell program is still bringing shell manufacturers into the market for machine tools, and will likely continue to do so for quite some time. However, it is the belief of some observers that many of the orders now either contemplated or standing on machine tool builders books for equipment needed in the shell program will never be filled. They are of the belief that the need for heavy shells, while continuing to be very great, will not be as great as originally anticipated, and only a portion of the shell making lines originally planned will be needed to supply the needs of the services.

A change might be forthcoming in some of the Navy's bomb requirements, in that there is a tendency to shift from the heavy blockbuster to the smaller type bomb. As far as can be determined, this is true only of Naval bombing requirements, and may point to the lessons learned in the South Pacific. Here, the Navy has borne the brunt of all island invasions, taking on the job of bombing and shelling the islands in a softening up action prior to actual invasion.

While the bombing and shelling has been perfect from a tactical standpoint, when the invaders actually went into the islands they frequently found that the damage was confined to the ground installations and that the Japanese had successfully dug in and were not too badly mutilated. Tarawa was an excellent example of this. The shift to the lighter bomb might be one of the Navy's answers to this problem, figuring that more bombs spread out over a wider area will be more effective.

If the Navy bomb program is changed to any great extent, it might mean another large retooling job among bomb manufacturers, and another shot in the arm to the machine tool industry. While individual machine tool builders and dealers indicate that their backlogs are down somewhat from the first of the year, from an industry point of view this does not seem to be the case. Shipments, according to the WPB, have fallen from $56,363,000 worth of machine tools in January to an estimated $36,500,000 worth in August, but actual new unit orders are higher and unfilled firm orders are up.

# A NEW, *Completely Revised Catalog* OF LINCOLN PARK PRODUCTS

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# Washington .

L. W. MOFFETT

**• Assistant Attorney General takes pot shot at one of the Department of Justice's pet targets, the basing point system . . . May presage forthcoming legal action.**

WASHINGTON — Broadcasting from Portland, Ore., recently, Wendell Berge, Assistant Attorney General of the United States, took another pot shot at one of the Department of Justice's pet targets, the basing point system. It is also a favorite of the Federal Trade Commission. Both Government organizations vie with each other in turning their legalistic blunderbuses loose on this pricing policy. They have long pointed to it as representing a wicked thing in the economic structure of the nation. In a rolling phrase they enjoy using, they say it plays a big part in the "concentration of industrial control" in violation of the antitrust laws.

When these attacks are made it is suspected, as in the tirade by Mr. Berge, that they presage forthcoming legal action. So do recurrent outbursts by the FTC indicate that it expects to continue its assault on the basing point system which it started about a score of years ago. Whether the two Government bodies are to work together or separately, or tussle with each other to see which gets the job, has not been disclosed. Probably the best guess is that it will be rationed.

The size of the subject always affords an excuse to maintain or increase the staffs. It is choice manna for bureaucracy. The Berge broadcast had the added elements of timing and setting. As for timing, it had the appearance of pre-election campaign material that fits into the patter of current Department of Justice forays against the railroads and big business generally. Delivered in the Far West, the blast apparently was designed to appeal to sectional feelings politicians like to stir up. They raise cries of railroad rate discriminations against the West in favor of the East, of the domination of the Eastern steel industry over the war built Western steel plants and other issues. These chords were played loudly by Mr. Berge.

Narrowing discussion of Mr. Berge's broadcast to the basing point system and his concern over disposition of the new steelmaking capacity in the Far West, the conclusion is clear that either by errors of omission or commission, he confused the issues.

Mr. Berge turned his fire on the basing point system by saying its abuses "have affected the West in many industries," notably in steel, petroleum products, sugar and cement. Referring to steel, Mr. Berge said that the great steel corporations for 50 years have sold it solely on a delivered basis except for a few products, such as steel rails bought by the railroads. On this point Mr. Berge was right, except his emphasis on "great steel corporations" perhaps left the impression that the smaller companies do not follow the same practices, though they do.

This means, Mr. Berge explained, that the delivered price in any area is the base mill price, plus the transportation to destination. Seeking to expose a hidden trick, Mr. Berge said that the trouble "with this seemingly innocent arrangement is that a relatively few Eastern mills are the base mills, and, I believe, none of them are west of Chicago."

Mr. Berge rates two fumbles here. First, mills in all important producing sections are "base mills," such as Pittsburgh, Chicago, Gary, Ind., Cleveland, Birmingham, Ala., Buffalo, Youngstown, Sparrows Point, Md., and others. Secondly, there are 14 basing points on the Pacific Coast: Everett, Bellingham, Seattle and Tacoma, Wash.; Wilmington, San Pedro, Stockton, San Diego, Oakland, Long Beach, Sacramento, San Francisco and Los Angeles, Calif., and Portland, Ore. These are Pacific port basing points for a wide range of products. Among the products are sheets, strip, black plate, carbon plates, carbon bars, reinforcing bars, cold finished bars and structural shapes. There are also six Gulf port basing points. They are New Orleans, Mobile, Ala., Galveston, Houston, Orange and Beaumont, Tex. These are not producing centers but they are basing points for such products as carbon bars, reinforcing bars, cold finished bars, carbon plates, alloy plates and structural shapes.

From his faulty premise, Mr. Berge drew an equally faulty determination. He said that "even though steel might be produced next door to the consumer, the price is the Eastern price plus imaginary freight to destination." Buyers pay the price at the basing point nearest to their plants, plus freight, no matter where the producing mills and consuming plants are located.

MOVING UP: *A tankdozer crosses a canal over a "fill-in" bridge built by U. S. Army Engineers, on its way to the Moselle River, France.*

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PERFORMANCE DATA

OPERATION—Machining Airplane Engine Cylinder.
MACHINE—Jones & Lamson 16" HD Fay Automatic Lathe.
MATERIAL—Nitrided Steel. SPINDLE SPEED—116 R.P.M.
CUTTING SPEED—266 surface feet per minute. FEED—.018 inch.
DEPTH OF CUT—9/16 inch. TOOLS—12 Cemented Carbide.
CUTTING LUBRICANT—1 part Sunoco to 20 parts water.

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It might be added that assailants of the basing point system always speak of "Pittsburgh-plus," using this long outmoded term to mean the basing point price plus transportation to destination and usually it was implied that transportation costs meant "phantom freight." Never is mention made of "Pittsburgh-minus." But the fact remains that the steel industry under the basing point system is forced by competitive conditions to absorb freight. It is taken out of steel company tills, not put into them. For example, any steel producer selling in peacetime to a consumer who is nearer a "base mill" than the selling manufacturer has to absorb freight to the extent that it exceeds freight from the base mill. Otherwise the "non-base mill" would not get the business. The OPA steel schedule diverges from this practice as a means of assuring wartime production.

This OPA departure, established to meet wartime dislocated demand, permits mills to charge transportation costs from the basing point nearest to the mill as distinguished from the basing point nearest to the buyer. That answers Mr. Berge's complaint that "during the war, with ocean shipping cut off, this has meant a Chicago price, plus $22 a ton freight."

He went on to say that the OPA ceiling price of ship plates is $42 a ton, f.o.b., Eastern mills. This freight now moves entirely by railroad. It is not phantom but fully paid freight, inasmuch as practically all large plate producers are at basing points. Eastern makers under the OPA provision can charge freight from the nearest basing points and the West Coast price becomes $64, the same basing point price allowed the only West Coast plate producer, the Kaiser plant at Fontana, Calif. This means a price of $3.20 Pacific ports, which is $11 a ton over the Eastern mill base price and was granted to Mr. Kaiser because of high production costs. Is Mr. Kaiser to be deprived of vital wartime plate business by forcing him down to the $2.65—$53 a ton—Pacific port price applying when ocean transportation is available? When the canal is reopened and Eastern mills no longer will have to pay all or no rail freight, they again will enter the Pacific markets at lower prices, and to continue in business the Fontana mill will have to meet that competition.

Mr. Berge asked what is to become of the DPC-built steel plants west of the Rocky Mountains at a cost close to $300,000,000. This probably is not the $64 question that it would seem. But there are a number of elements that require consideration to find the answer. The cost of the Pacific Coast and the Provo, Utah, war built plants was high. Hence, if they are sold to private interests it is evident that the Government will have to take a big loss in investment. Even then these plants will have to expand rolling rather than ingot capacity and find markets, old and new, which on the basis of prewar requirements were not sufficient to consume the existing new capacity.

## Issue Pre-Termination Regulation

***Washington***

• • • Designed to speed the ending of war contracts, Robert H. Hinckley, director of Contract Settlement, recently issued General Regulation No. 3 for pre-termination settlement agreements. Through pre-termination, it was pointed out, contracting agencies can make settlement agreements with war contractors in advance of the actual termination of contracts, resulting in savings in time for reconversion to peacetime work and minimizing dislocation and unemployment. Director Hinckley said that the War Department has had some experience in negotiating agreements of this type, particularly in the textile field and in some phases of ordnance production.

These experiments, Mr. Hinckley explained, indicate the great desirability of agreeing beforehand, where sufficient data is available to permit reasonable forecasts on a sound commercial basis, on items such as the unit cost of the inventory which the contractor will have on hand at various stages of manufacture, whether this inventory is to be scrapped, taken over by the Government, or retained by the contractor, and the prices which should apply if the contractor plans to keep it.

The agreements, Mr. Hinckley said, may cover one or more of the elements that will be involved in termination claims. They are to be used when they will substantially facilitate settlements, plant clearance, reconversion to civilian production or the efficient use of materials, manpower and facilities or will otherwise promote the objectives of the Contract Settlement Act of 1944.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

WHY-UH-MISS CHINSY, I FORGOT TO INFORM YOU THOSE HOLES DON'T NEED OIL--BUT I DO ADMIRE YOUR-UH-DILIGENCE!
I HALF WISH WOMEN WORKED HERE IN OUR DAY--YOU KNOW WHAT HE'D OF SAID TO US--'YOU FATHEAD, POURIN' OIL IN TH' CENTER HOLE OF A SHAFT! THAT'S JUST A DENT, YOU FOOL!"
NO, NO--WE LEARNED QUICKER IN SPITE OF OUR DUMBNESS! DIPLOMACY LEAVES DOUBT--WE NEVER GOT ANY SO WE'RE NEVER LEFT IN DOUBT!
LADIES AND "GENTLEMEN"
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J.R.WILLIAMS
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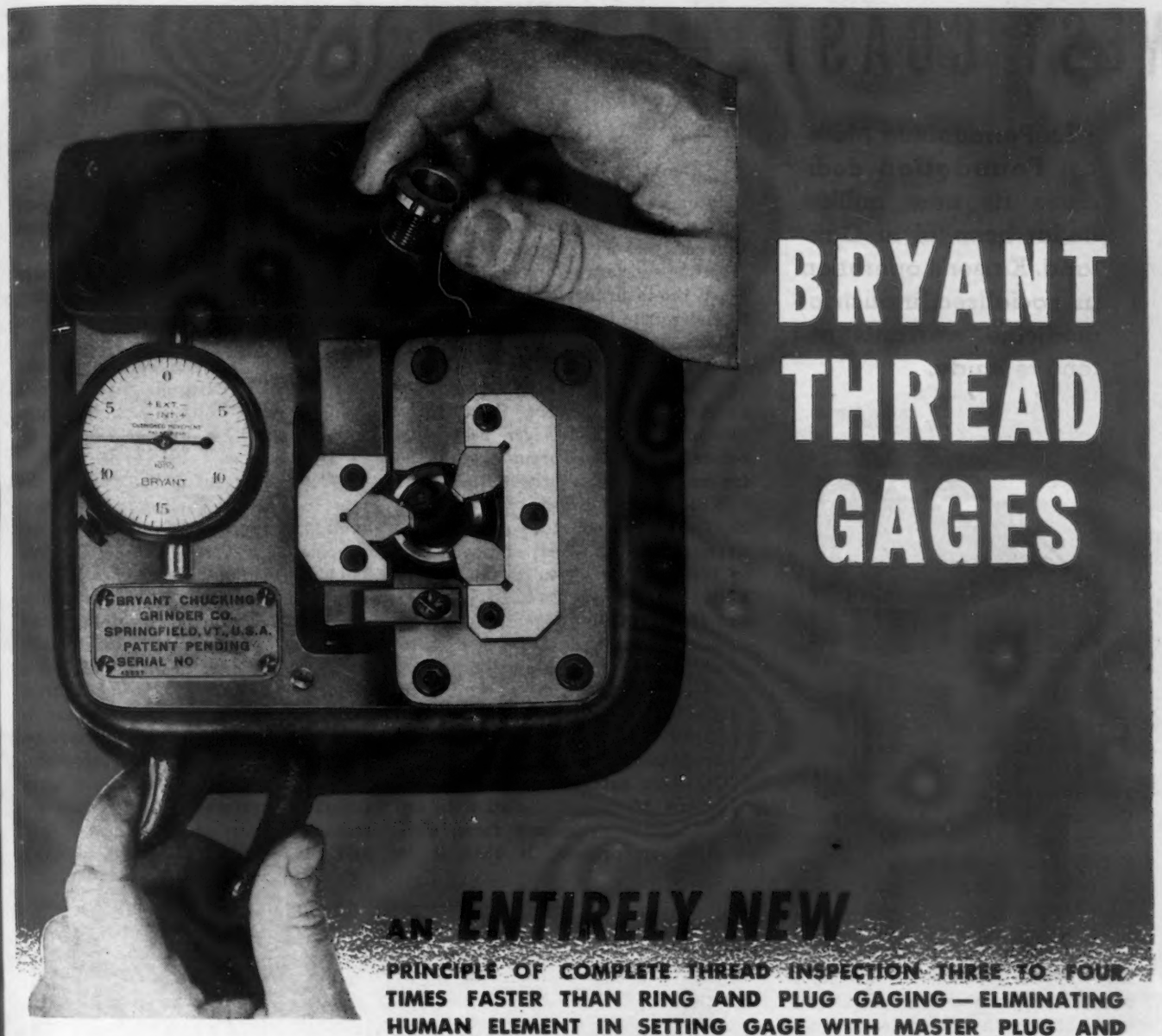



# BRYANT THREAD GAGES

## AN *ENTIRELY NEW*

**PRINCIPLE OF COMPLETE THREAD INSPECTION THREE TO FOUR TIMES FASTER THAN RING AND PLUG GAGING—ELIMINATING HUMAN ELEMENT IN SETTING GAGE WITH MASTER PLUG AND DURING INSPECTION OF WORK PART.**

- ★ One unskilled operator replaces four or five skilled inspectors.
- ★ Gives complete over-all inspection in a few seconds.
- ★ Thread segments have many times the life of ring and plug gages.
- ★ Master gage accuracy transferred quickly to production parts.
- ★ Available in three standard models. (Special sizes on request.)

The NEW BRYANT THREAD GAGE checks the entire circumference of internal and external threads in a few seconds. The operator merely drops the part on the work rest, releases the control lever, and gives the work a *partial* turn only. The dial reading shows the accumulated inaccuracies in lead, taper, pitch diameter, thread form, and the presence of burrs or surface inaccuracies.

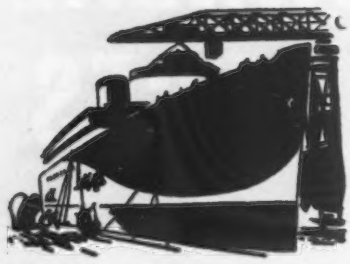
The Bryant Thread Gage makes it possible—*as never before*—to transfer the measurements of master thread gages accurately and quickly to the parts being produced—it eliminates tedious, slow, and expensive methods requiring skilled inspectors. Write today for illustrated folder No. G2 which gives complete details.

**BRYANT CHUCKING GRINDER COMPANY**

SPRINGFIELD, VERMONT, U. S. A.

# WEST COAST . . . OSGOOD MURDOCK

**• As Permanente Medical Foundation dedicates its new million dollar hospital in Oakland, Kaiser's operation in socialized industrial medicine warrants attentive study.**



SAN FRANCISCO — With the mid-October dedication of Henry J. Kaiser's new million dollar Permanente Foundation Hospital at Oakland, Calif., and Dr. Sidney Garfield's recent address to the National Safety Council at Chicago, students of industrial medicine are asking "Has the Midas touch done it again?"

California, the hot-bed of rebellion against the status quo in all three fields of the practice of medicine—private, cooperative and industrial—is rumbling with its own peculiar type of labor pains.

Mr. and Mrs. Henry J, Kaiser's Permanente Foundation, spearheaded by Dr. Sidney Garfield, may well be carrying the foetus which will answer the universal plaint that "the doctors don't give a damn about the working stiff." Attacked from all sides, by the mighty and the modest, the right and the left, the hierarchy of organized medicine, labor unions and everyone else seemingly but the Ubangi witch doctors, California industrial medicine appears to be about ready for the nation's delivery table.

In the mid-thirties Dr. Garfield emerged from the Los Angeles County Hospital and, like the late evangelist, "came up in the desert" at the Los Angeles Aqueduct construction job. There, appalled by the long haul for injured men to inadequate medical facilities, he built a small field hospital on a sheer gamble with his own limited savings and began to give the men a kind of medical service they had never seen before. Like any pioneer he had his financial troubles, but, with the enthusiastic approbation of the men, financial support from the subcontractors soon followed. Next, the insurance companies agreed to underwrite the project to the extent of 17½ per cent of their premiums.

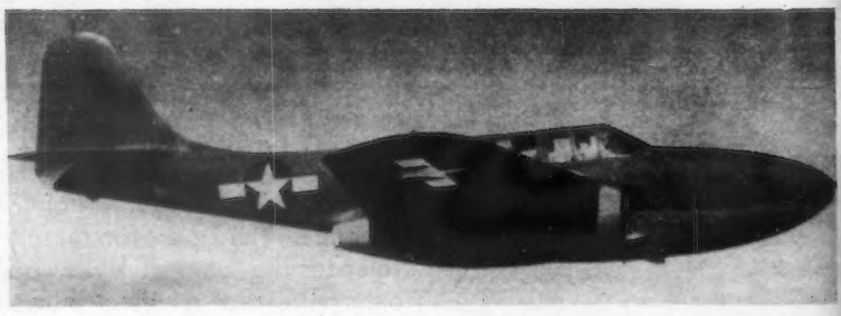
There began a practice of industrial medicine, according to Dr. Paul de Kruif, the Microbe Hunter, the like of which had never been seen before, first class prepaid medicine for employees at a cost of 5c. a day!

When Henry Kaiser ran into the blind alley of boom-town medicine at Grand Coulee, the Gods of Good Luck or Wisdom—whichever is the Kaiser Deity—brought the two, Dr. Garfield and Henry Kaiser, together.

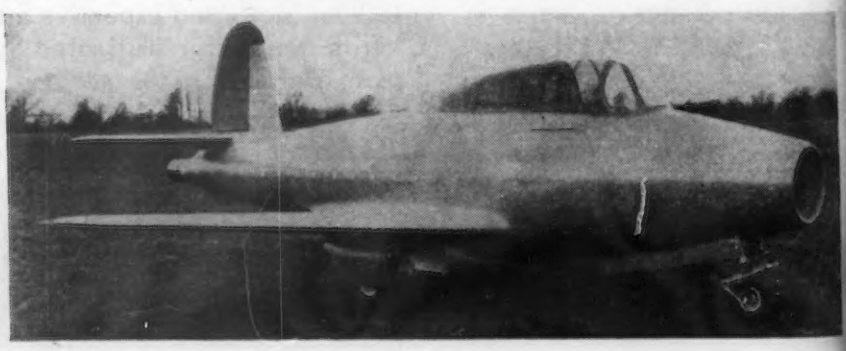
Whereas on the desert, doctors were in about the same ratio to employees as Dodos to desert rats. At Grand Coulee Dr. Garfield for the first time ran into the opposition of local organized medicine—and hard.

The deep seated objection of the American Medical Association to organized medicine in any form, government or private, is that it is "panel" medicine; that the patient may not exercise the right of freedom of selection of the physician to treat his own particular ailment. Under government socialized medicine, they point out, the doctors are rotated on the "panel" and you may get a goiter specialist to deliver your baby and a G. U. to treat your sinus. In a modified way, they claim, the same criticism may be applied to any form of organized medicine.

With the advent of the war and the inception of the Richmond and Portland shipyards, the Grand Coulee experiment led the Kaiser-Garfield team to inaugurate a similar medical setup for the rapidly growing shipyards. Here started another battle royal, and the eminent Dr. Morris Fishbein came to the Coast to take a hand. The conflict raged from Senatorial investigation chambers to War Manpower Commission hearings, Selective Service and Procurement and Assignment Service. The charges included interference with the assignment of doctors to the armed forces, and the answer came: "You can't



FIRST JET PICTURES: *The American jet-propelled airplane, the P-59A Airacomet built by Bell Aircraft and powered with General Electric engines is above. The first British jet airplane to be used operationally, built by Gloucester Aircraft, used "with success" against robot bombs is below.*



# *Now* . . . EX-CELL-O BROACH SHARPENING MACHINES

AVAILABLE IN 4 STYLES FOR MOST EFFICIENT PRODUCTION

**FOUR STYLES EX-CELL-O BROACH SHARPENING MACHINES**

No. 80 Small Machine for Round Broaches
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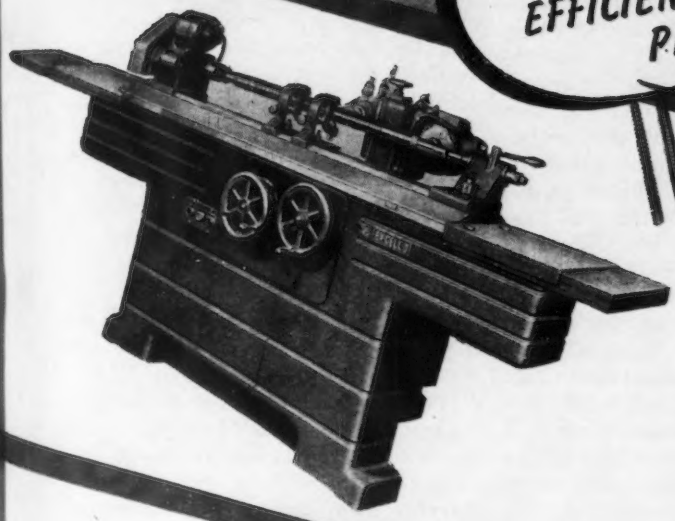
No. 81-L Large Machine for Flat Broaches

For further information, write to Ex-Cell-O Corporation, 1200 Oakman Blvd., Detroit 6, Mich., and ask for specifications on new Ex-Cell-O Broach Sharpening Machines.



**EX-CELL-O—STYLE 80**

For economical sharpening of round broaches. Has heavy base and sturdy, well-supported table. EX-CELL-O precision ball bearing spindle assures freedom from vibration, maximum service life, and a good grinding finish. V-belts and 3-step pulleys allow a practical range of work speeds. Push button controls are on front of the machine.

**EX-CELL-O—STYLE 81-L**

For sharpening flat broaches and grinding straight slots, keyways, and grooves to close tolerances. The cross travel of the spindle is manually operated. Adjustable stops are provided so that spindle travel in either direction can be accurately limited when necessary. Ex-Cell-O broach sharpening machines have been in use in Ex-Cell-O plants.

MANY years of experience in the production of broaches, broaching fixtures, and precision machine tools form the background for the design and manufacture of Ex-Cell-O broach sharpening machines. Each machine is built to give the utmost in speed, accuracy, and economical production. Each combines simplicity and ruggedness in construction, with modern streamlined appearance. These new Ex-Cell-O broach sharpening machines are special purpose machines. They are ideal for large production set-ups, and are advantageous also for occasional work. By the use of Ex-Cell-O broach sharpening machines, set-up time is highly minimized, the hazard in changing equipment is practically eliminated.

**EX-CELL-O CORPORATION**
**DETROIT 6, MICHIGAN**

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SPECIAL MULTIPLE WAY-TYPE PRECISION BORING MACHINES • SPECIAL MULTIPLE PRECISION DRILLING MACHINES • PRECISION THREAD GRINDING, BORING AND LAPPING MACHINES • BROACHES AND BROACH GRINDING MACHINES • HYDRAULIC POWER UNITS • GRINDING SPINDLES • DRILL JIG BUSHINGS • CONTINENTAL CUTTING TOOLS • TOOL GRINDERS • DIESEL FUEL INJECTION EQUIPMENT • R. R. PINS AND BUSHINGS PURE-PAK PAPER MILK BOTTLE MACHINES • PRECISION AIRCRAFT AND MISCELLANEOUS PARTS

fight a war without ships, you can't build ships without men, and you can't keep men without medical care, and there aren't enough doctors to go around anyway." The outcome was that the Kaiser Health Plan remained in force.

When the California shipyards started, Dr. Garfield and Mr. Kaiser had received more than their share of dousings at the baptismal font of objections to corporate medicine. Benefiting by past experience they took the doctors of Alameda County Medical Association into their confidence on every step along the way. As the armed forces drained off the medics by droves, the ratio of doctors to patients had become acute.

Having demonstrated that "prepaid family medicine" was practical at 50c. per week per adult and 25c. per child, and having proved to private practitioners that the Kaiser health plan did not decrease their practice under the circumstances, Kaiser and Garfield proceeded with the erection of their first quarter-million dollar hospital and field service. The rate of sign-up among the employees was so rapid that three months later the hospital was enlarged at a cost of $300,000. By this time the eyes of the San Francisco and Oakland bankers who had made construction loans were popping like rivet guns. The loans were repaid at an initial rate of $25,000 per month; in three months repayment stepped up to $50,000. The money came from the same two sources that had saved Dr. Garfield's medical-financial neck years earlier, 50c. a week from 65,000 shipyard workers and approximately 18 per cent of the insurance premiums, in a ratio of about 60 to 40 per cent, in spite of certain restrictions concerning pre-employment ailments, total, unlimited treatment for any cause whatsoever.

It was still not what might be called a bed of roses. When zeros and dollar signs start rolling around like the eyes of the bankers, someone was bound to take a second look. In this case it happened to be certain labor unions and representatives of the left who, to put it tersely, wanted to know "where all the dough was going." This and long waits for admittance to the doctors' offices seemed to be a starting point for new attacks. These were accompanied by the inevitable rumors from the grapevine that the good doctor was "cleaning-up." Accompanied by the resentment of reputable manufacturing pharmaceutical houses that the institution had entered the drug manufacturing field and were getting a free ride on their considerable investment in medical research, the criticisms had a definite element of validity.

Some years back, in the mid-thirties, California, often a rebel and sometimes a leader, had, under the aegis of the California Medical Association, taken the bull of government socialized medicine by the horns and thrown it for a considerable loss. Aggressive members of the profession, confronted with a so-called liberal gubernatorial administration and considerable agitation for this "reform" had organized the California Physician's Service. This was a non-profit organization comprised of any or all members of the county medical associations. It was setup to furnish prepaid medical care to all members of a family, not merely industrial care, on a monthly prepaid basis. Organized and conducted as it was by reputable physicians themselves, it took hold, not without opposition from the die-hards within, and not without serious growing pains attendant to such a revolutionary move.

For independent medical practitioners to kick over the traces of medical tradition and create their own brand of "organized medicine" was heresy. Yet the foresighted physicians of the state recognized the possibility of improving the medical lot of working men, and in spite of their organizational growing pains and some heated medical association meetings, they stayed with it. As war drained off the geographical surplus of doctors, and the practice and collections of remaining practitioners improved, the very doctors who had foreseen the need for a critical review of the traditions of medicine began to forget the reasons which had led them to inaugurate the service. Fortunately the believers stood fast. When finally the ratio of doctors to California's war-swollen population had fallen far below the danger point and when the offices of established physicians were swamped, Blue Cross Hospitalization and Permanent Medical Foundation were thankfully accepted.

Permanente medical problems multiplied. Male heads of families were to receive the Kaiser treatment, but under Dr. Garfield's philosophy of turning away no patient, wives and children (not included in the plan) were suffering from lack of adequate care. The incidence of death to sickness was growing alarmingly. If the rate continued it would eventually break the plan. Permanente called in the unions in the customary Kaiser manner, explained the situation and turned them loose on the problem. They saw and acted. Families were brought into it at the same low rates and the condition corrected itself to the point where a new and greatly enlarged hospital was needed to care for the increased practice.

With the imminent dedication of the New Permanente Hospital, negotiations are under way for a joint plan of operation with medical association groups. Assuming the hoped-for success of the negotiations, there will be a wedding of significance between private, low-cost medicine and industrial prepaid medicine permanently precluding the disadvantages of bureaucratic socialized medicine.

## Cited for Awards

• • • **The following companies have** been awarded the Army-Navy "E" for outstanding war production:

**Allen Industries,** Leland and Grand Trunk Plant, Detroit, Mich.

**Anaconda Wire & Cable Co.,** South Mill and North Mill, Sycamore, Ill.

**Applied Arts Corp.,** Grand Rapids, Mich.

**Ames Baldwin Wyoming Co.,** Plants No. 1 and No. 2, Parkersburg, W. Va.

**Certain-teed Products Corp.,** Pantex Ordnance Plant, Amarillo, Tex.

**Crown Zellerbach Corp.,** Seattle Charcoal Division, Chemical Warfare Service, United States Army, Seattle Plant, Seattle, Wash.

**Detroit Brass & Malleable Works,** Detroit Plant, Detroit.

**Eddy Shipbuilding Corp.,** Bay City, Mich.

**Electronic Corp. of America,** New York.

**Essex Specialty Co.,** Hackettstown, N. J.

**L. H. Eubank & Son,** Inglewood, Cal.

**Foley Mfg. Co.,** Minneapolis.

**Gould Storage Battery Corp.,** Depew, N. Y. (second star)

**Greisser & Shlager Iron Works,** Somerville, Mass.

**Gruen Watch Co.,** War Instrument Division, Time Hill, Cincinnati.

**Hendrethorn Mfg. & Supply Co.,** Littleton, Colo.

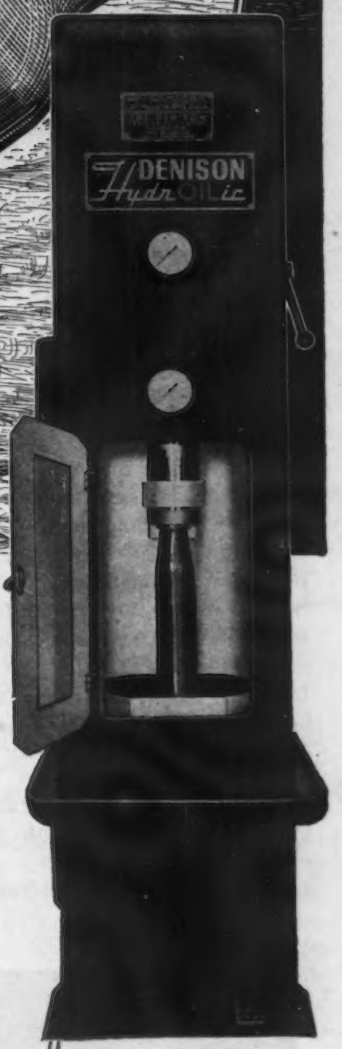
**Hercules Powder Co.,** Sunflower Ordnance Works, Lawrence, Kan.

**Heller Brothers Co.,** Newcomerstown, Ohio.

## WPB Amends L-77

*Washington*

• • • **An amendment to L-77,** announced last week by WPB, permits the making of metal storm windows from aluminum, magnesium or other metals provided the materials are obtained from idle or excess inventories. Formerly, metal storm windews could be made only from material put in process before April 4, 1943.




. . . and that's exactly what this important piece of ordnance was supposed to do, if it wasn't "fit for action"! Tested under tons of water pressure, in the Denison Hydrostatic Test Press shown at right, it burst—thus preventing what may have been a deadly gun-accident had it reached the fighting front . . . Another of the many ways Denison oil-hydraulic equipment serves the nation today!

Think about it . . . Doesn't a press like this, with its HydrOILic fingertip control of pound-by-pound pressure, fit into your wartime production scheme, or your postwar plans? It could burst-test tubing of all kinds — ceramic, plastic or metal. It could easily and accurately test the impregnation qualities of hundreds of materials . . . could be used for production-line impregnation of small parts. It could burst or collapse-test small containers made of plastic, metal or glass. Porosity tests of innumerable materials could be effectively made through its close control of pressures from a few pounds to tons.

THE DENISON ENGINEERING COMPANY
1158 DUBLIN ROAD COLUMBUS 16, OHIO

***Today or Tomorrow***

**We're working 100% for Uncle Sam today. That means priorities are necessary for any HydrOILic equipment. If you have those priorities, we will gladly work with you now. If not, file this page in your postwar plans.**

INDUSTRY'S NEW RIGHT HAND FOR POWER, SPEED and CONTROL

DENISON
EQUIPMENT *in* APPLIED
HydrOILics

# PERSONALS

• **M. K. Hovey** has been appointed general plant manager of Chevrolet plants in Flint, Mich., succeeding **H. F. Howard**, resigned. A veteran of 33 years with General Motors, Mr. Hovey has been chief inspector of the Pratt & Whitney aviation engine project of Chevrolet at Buffalo since 1941.

• **J. H. Jewell** has been appointed manager of the Industry Departments of the Westinghouse Electric & Mfg. Co., East Pittsburgh. **B. M. Brown** has been made manager of the Petroleum and Chemical Section, succeeding Q. M. Crater, who has been transferred to the Detroit office of the Industrial Department as assistant manager.

• **John A. Fraser**, formerly plant manager of Die Typing Corp., Pontiac, Mich., has been appointed metallurgist of the Starr Heat Treating Co., Detroit.

• **Van M. Darsey** has been elected president and a member of the board of Parker Rust Proof Co., Detroit. **Robert W. Englehart**, secretary, and **A. C. LaRowe**, manager of the Morenci, Mich., plant have become vice-presidents. Willard M. Cornelius, formerly president, has resigned to become chairman of the board. Mr. Darsey joined the company in 1927, advanced through various technical and service jobs to technical director before becoming president.

**J. EMMET FINK and JULIUS A. CLAUSS, vice-presidents, Great Lakes Steel Corp.**

• **J. Emmet Fink**, general works manager of Great Lakes Steel Corp., Detroit, has been appointed vice-president in charge of operations. **Julius A. Clauss**, chief engineer and former WPB official, has been named vice-president in charge of engineering.

• **William J. Van Vleck** has been appointed manager of the Atlanta office, Worthington Pump & Machinery Corp., Harrison, N. J., succeeding **Edward Stauverman**, who has resigned. Since 1938 Mr. Van Vleck has been assistant manager of the Philadelphia district office. **C. W. Camp**, formerly with Crocker-Wheeler Electric Mfg. Co. for 38 years, has joined Worthington as consulting electrical engineer.

• **Charles A. Simmons, Jr.**, vice-president of the Simmons Machine Tool Corp., Albany, N. Y., has been appointed chairman of an industrial committee which will survey present and postwar employment possibilities in Albany industries.

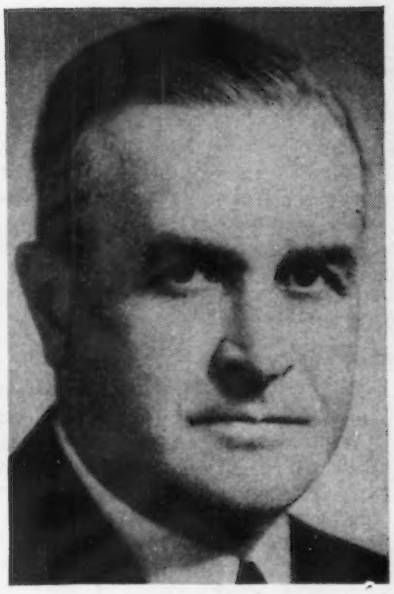
• **H. M. Cherry** has been made general manager, George L. Nankervis Co., Detroit. For the past five years he has been equipment engineer with the A. T. Wagner Co. **Donald C. Hulse** and **George R. Young** have been appointed designing engineer and service engineer, respectively.

• **Arthur Nutt**, who resigned recently as vice-president of engineering of Wright Aeronautical Corp., has joined Packard Motor Car Co. in an executive engineering capacity. He will be associated with direction of development and research work in the Aircraft Engine Division of Packard at Toledo.

• **J. P. Larkin** has been appointed chief metallurgical and sales engineer of the Steel Division, Firth-Sterling Steel Co., McKeesport, Pa. For two years he served with the Alloy Steel branch of the WPB, while on special leave of absence from the Crucible Steel Co. **Andrew H. Godfrey** has been named assistant manager of the Firthite Division. Mr. Godfrey had been factory manager of Carboloy Co. and recently production coordinator of the Cleveland Ordnance District. **Anthony J. Allen** has been made the new assistant manager of the Firthaloy Division. Since 1941 he had been superintendent of the Gary plant of Tubular Alloy Steel Co. Two district sales managers have also been appointed.

**VAN M. DARSEY, president, Parker Rust Proof Co.**

**J. P. LARKIN, chief metallurgical and sales engineer, Steel Division, Firth-Sterling Steel Co.**



JAMES B. BLACK, director, U. S. Steel Corp.

• **James B. Black** of San Francisco, has been elected a director of the U. S. Steel Corp. Mr. Black is president of Pacific Gas & Electric Co., San Francisco. He becomes the first Pacific Coast director of the Steel Corporation.

• **A. W. Nelson** has been made district sales manager of the Indianapolis office of Allegheny Ludlum Steel Corp., Brackenridge, Pa. He was formerly district representative in Minneapolis. **R. C. Presley** from the Chicago district, succeeds Mr. Nelson.

• **Paul F. Schucker** has been appointed to the executive staff of Charles A. Koons & Co., New York. Mr. Schucker, who has been chief of the WPB Export Steel Branch for the past three years, will be in charge of the export department.

• **Fred Grotts**, president of Fort Pitt Steel Casting Co., a subsidiary of H. K. Porter Co., Inc., Pittsburgh, has been appointed to a newly created position, in addition to his present one, as director of research and metallurgy for all Porter plants. He will have charge of problems relating to materials and metallurgy, and will direct new product developments.

• **Leopold H. P. Klotz** has been elected vice-president and treasurer of the Luscombe Airplane Corp., Trenton, N. J.

• **John J. Farrell** has been appointed treasurer of the American Steel & Wire Co., succeeding Robert E. Lewis, who recently resigned as announced in IRON AGE, September 7.

• **H. R. Laubach**, chief inspector of the Diesel Equipment Division of General Motors, Grand Rapids, Mich., has been named works manager. He has succeeded **Claud Coon**, who resigned to become general manager of five plants of the Standard Products Co., at Port Clinton, Ohio. **H. Norman Zoet**, former assistant chief inspector, has been made chief inspector at the Diesel Equipment Division and **A. H. Adamson** has been appointed personnel director.

• **E. M. Lacey** has been appointed eastern district appliance manager for Westinghouse Electric Supply Co., New York. He succeeds **J. L. Johnson** who has recently been appointed appliance manager of the Northwestern District, Chicago. **C. M. Mackey** has been made manager of the Southwest District, with offices in Dallas.

• **Charles P. Whitehead** has been elected a member of the board of directors of General Steel Castings Corp., Eddystone, Pa. Mr. Whitehead has been with the corporation and its predecessor for 25 years and has been a vice-president since 1938.

• **A. A. Kucher**, director of research of Bendix Aviation Corp. and chairman of its long-range planning committee, has been elected a vice-president. Mr. Kucher is head of the corporation's central research laboratories in Detroit.

• **John O. Roser** has been made assistant to H. V. Erben, commercial vice-president and manager of the central station division of General Electric Co., Schenectady. Mr. Roser was formerly manager of the transformer division at Pittsfield, Mass.

• **Richard E. LeBlond**, president of the R. K. LeBlond Machine Tool Co., Cincinnati, has been elected to the executive committee of the Machinery and Allied Products Institute.

WILLIAM S. WILBRAHAM, production manager, Lukenweld, Inc.

• **William S. Wilbraham**, since 1943 manager of costs and more recently assistant to general manager of Lukenweld, Inc., Coatesville, Pa., division of Lukens Steel Co., has been appointed production manager. **George L. Snyder**, chief engineer since 1938, has been made chief engineer and assistant to the general manager. **Paul Sikora** has been made plant accountant. **Mr. Wilbraham**, who has been with Lukens Steel since 1927, will have general supervision of all production activities. Mr. Snyder, in addition to his duties as head of all Lukenweld engineering, will also have general supervision of inspection.

• **W. H. Savage** has been appointed manager of the general equipment and materials department of Robert W. Hunt Co., Chicago. **G. W. Stierer** has been appointed manager of the structural steel department and **H. A. Ford**, the manager of the railway car department.

# OBITUARY...

• **Charles W. Beaver**, 68, associate director of research and product development for the Yale & Towne Mfg. Co., Stamford, Conn., died Sept. 23. He had served 35 years with the company.

• **William A. Gray, Jr.**, secretary, vice-president and purchasing agent of the Crescent Brass & Pin Co., Detroit, died recently.

• **George W. Smith**, Milwaukee branch manager for the Joseph T. Ryerson & Son, Inc., Chicago, since that firm purchased his Reed-Smith Steel Co. 20 years ago, died Sept. 20.

• **George G. Bach**, production manager for the Stolper Steel Products Co., Milwaukee, who had been with the firm 25 years, died Sept. 20.

• **Frank H. Reagan**, 72, chairman of the board of the Locke Insulator Corp., Baltimore, Md., died suddenly Sept. 10. Mr. Reagan had been associated with Locke in various executive capacities for over 20 years.

# Fatigue Cracks . . . BY A. H. DIX

### Fancy Front Not Needed

• • • In the piece, announcing his retirement from the European front, Ernie Pyle, our favorite columnist, said that his favorite general is Omar Bradley. He also expressed the fear that General Bradley's modesty would prevent him from getting the present credit due him and that he might have to wait until the history books are written.

From here it looks as if the fear is groundless. Bradley's star is high on the home front, and is brightened rather than dimmed by his modesty. The camera never catches him in a dramatic pose. He never makes a boastful prediction. He utters no epigrams. All of which endear him to us. But what principally arouses our confidence in him is that he looks like a successful businessman, which we observe is also true of top shelf surgeons, machinery designers, salesmen, metallurgists, actors, aviators, confidence men, pitchers, master mechanics, and editors.

If we owned a book on psychology we could probably find the scientific reason for this, but in the meantime our guess is that the compulsion to make like a top shelf surgeon, confidence man, machinery designer, actor, pitcher or general, is a manifestation of self-doubt, and the less the self-confidence, the greater the compulsion. We have spent much time erecting this theory and we hope those who know of exceptions will keep them to themselves.

### Stoppers

• • • The Powerful "Sap" of the Whiffletree—*American Engineering Co.*

You can't go wrong unless you have Achromatopsia. —*International Plastic Corp.*

### Anaptronym

• • • The officer in charge of the Navy's Bureau of Supplies and Accounts at Cincinnati is Lt. Comdr. J. F. Skipper. At first thought it seems a shame to waste a name like that on a desk job. But no doubt the Navy considered the matter carefully and wisely decided not to risk an Abbott and Costello routine beginning, "Who is the skipper of this ship?" "Skipper." "Yeah, but what's his name?"—and on and on.

### Prod In Our Posterior

• • • Normally trigger-quick Charles T. Post, who covers the Chicago beat for you, was caught with his mind on safety catch when a visiting Russian metallurgist asked "What is the function of THE IRON AGE—advertising?" So we reported last week. We added that when the question was asked we were not prepared to answer it, as the thought that there was anything reprehensible about working for pay had never entered our minds.

Since then we have marshaled our forces and are now prepared to prove that we would very likely go to pot in a hurry if we worked for free. If, for instance, your favorite family journal were owned by the government you would have to entertain us whether you liked us or not. This would be a cushy situation for us but not for you. As it is now, when your love dies, you stop sending us your $8 (abroad, $15) and we stop sending you your favorite family journal.

It is obvious that if this got to be epidemic, we would cease to be. The feeling within us against ceasing to be is strong. So we hustle.

### Pyorrheic Proportion

• • • Obviously the proportion of you who continue to send in the $8 (abroad, $15) is an accurate pyrometer for measuring the heat of your love. At the moment the pyrometer measures 78.87 per cent, with no correction for unavoidable cancellations such as occupational changes and plant closings.

This means that close to four out of five renew, which would be something to brag about, if we were not for the moment emulating our favorite general, the modest Omar Bradley.

### Flowers Without Perfume

• • • We are proud that our subscription renewal percentage is stratospheric and never miss an opportunity to work it into the conversation, but we confess that we do not find statistical cheer very warming. Our blood should flow faster, we suppose, over the fact that an elaborate "change in readership" survey made by another publisher, comparing the twenty leading publications' reader interest ratings this year and last, places us among the half that have gained in influence.

But what does cause our breath to come in short pants are the little pats on the back beyond the line of duty, as for instance the letter from R. G. Le Tourneau, Inc., the big earth-moving equipment builder, telling us that the boss himself carries your favorite family journal around with him in his airplane; the letter from S. G. Baker, director of DuPont's electroplating division, casually mentioning something he saw "in my favorite family journal;" the little orchid added to a routine letter from the Watertown Arsenal—". . . we certainly find use for your magazine."

For some reason we can't figure out, the more incidental the bouquet the sweeter the smell. We suppose our suspicion of the large floral pieces dates back to the time when we used to ask loving friends if they would mind writing us a nice piece to use in our own publicity. The results were beautiful but had no more fragrance than a delphinium.

### With Lashes Low

• • • Modesty can be overdone, in which case it becomes more blatant than the most unrestrained boastfulness. As an example, we lift the following from *Printers' Ink*, which took it from Ed (*New York News*) Sullivan, who saw it in the *Stars and Stripes:*

> At Cherbourg, United States engineers built a bridge for American armor, while a few rods away, Britishers built an emergency auxiliary. The next day the U. S. bridge carried this ribbing placard:
>
> *This bridge was built by American engineers, under fire. It was built by 35 men in 2¾ hours. It contains 67 tons of material, and can stand a stress of 15 tons.*
>
> The next day, the Britishers jibed back with a neat placard on their bridge:
>
> *This bridge was thrown together by British engineers as a routine job. There is nothing remarkable about it.*

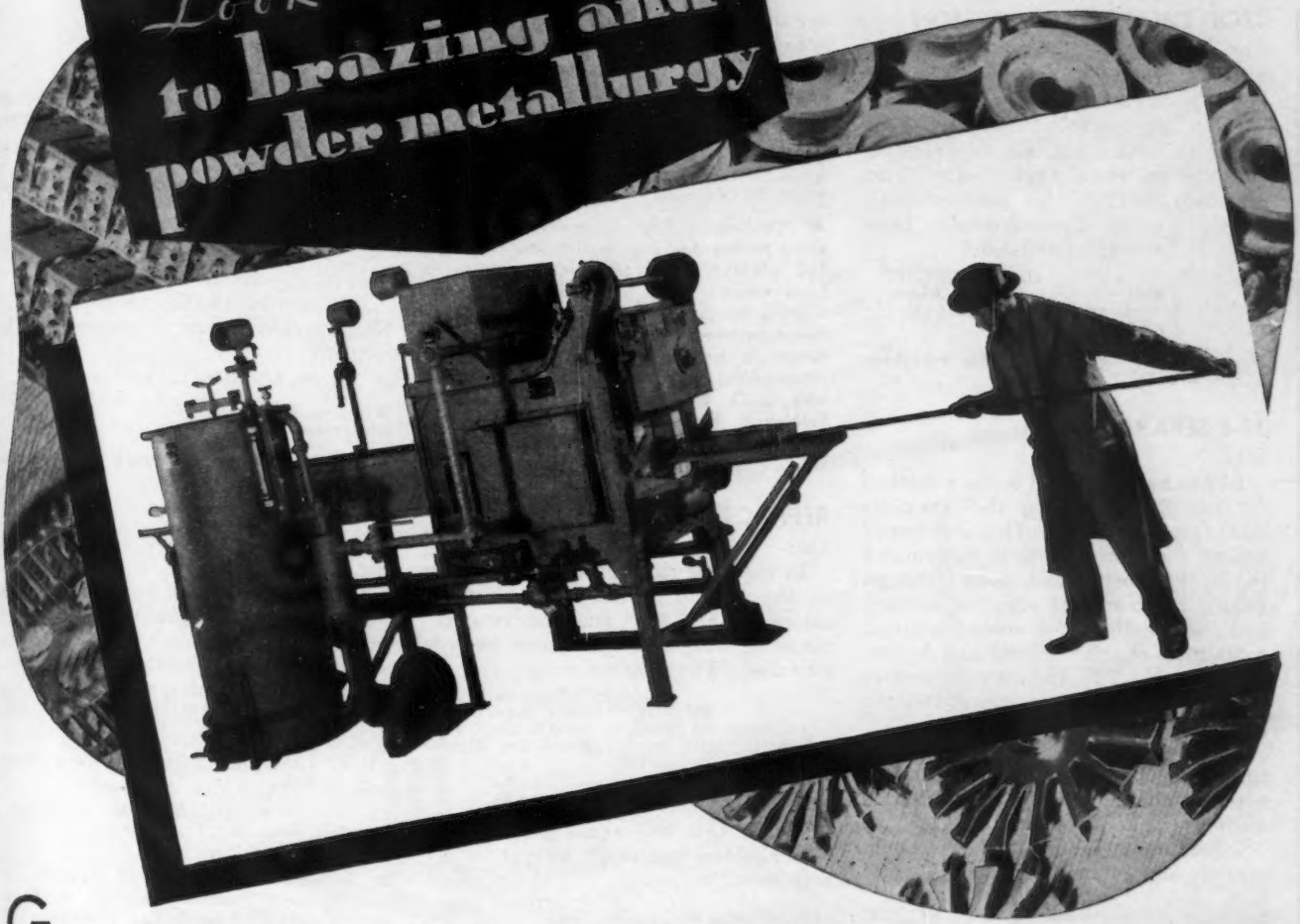
*Printers' Ink* uses the American placard as a text for an editorial on boastful advertising. This seems to us to be unfair, for the placard is no more than a simple expression of honest pride in a job well done. If it were not saved by its humor, we would regard the British message as an example of understatement exaggerated to an insufferable degree.

### Puzzle

• • • It is a long time since we have run a puzzle calling for the exercise of pure reason, so here goes:

> *A generous jailer walks into a cell block and says to three prisoners, "I hold in my hand three white disks and two black ones. On the back of each of you I shall pin one of these disks. None can see his own disk, although you can see your companions'. If you guess correctly that your own disk is white you will be released."*
>
> *With this he pinned a white disk on the back of each and left them in the care of a guard. How can each of the three prisoners, A, B, and C, guess whether his disk is white?*

# *Look ahead!* to brazing and powder metallurgy



Great changes loom ahead in metal fabrication! You might well consider the low cost processing and speedy output possible in the fields of both production brazing and powder metallurgy.

We have prepared a bulletin with valuable information on brazing and powder metallurgy which is free for the asking. It contains sketches and photographs of brazing metal application and descriptive material on powder metallurgy methods. It also gives illustrations and detailed descriptions of the new Lindberg High Temperature Brazing Furnaces, one of which is pictured above.

These new furnaces are sturdy, carefully engineered units designed to operate at a temperature up to 2500° F. with precise temperature control and heating uniformity, plus a neutral controlled atmosphere. They cut production costs to the bone and on certain sub-assemblies give more strength, simplicity of fabrication and cleaner work. They have outstanding advantages in economy of operation, easy maintenance and operator convenience in loading and unloading.

In the larger sizes they may also be used for other purposes such as hardening high speed tools and dies for your toolroom and for bright annealing, normalizing and other heating operations requiring a protective atmosphere.

**Write for Bulletin**

You should know about new developments in these important metallurgical fields. Send for your copy today.

**LINDBERG ENGINEERING COMPANY**
2452 WEST HUBBARD STREET, CHICAGO 12, ILLINOIS

**In Cleveland!**
This furnace will be set up on exhibition at the Metals Show. Be sure to come to booth C-150.

ARMY E NAVY

# Lindberg FURNACES

**SUPER-CYCLONE** for hardening, normalizing, annealing, tempering

**CYCLONE** for accurate, low-cost tempering and nitriding

**HYDRYZING** for scale-free and decarb-free hardening

# Dear Editor:

## IZOD CHARPY CONVERSION

Sir:

We have been asked to meet a Charpy impact test on a standard .394 in. sq. keyhole notched Charpy bar but have only an Izod testing machine on which we test .450 in. rd. standard British test pieces. Could you inform us if a conversion table in ft.-lb has been published?

*H. J. WRIGHT,*
*Chief Chemist and Metallurgist*
*Federal Foundries & Steel Co., Ltd.,*
*London, Ontario*

● No such conversion table has ever been published.—Ed.

## 18-8 SEPARATION

Sir:

I have had described to me a method for rapidly separating 18-8 stainless steel from 18-8 SMO. This consists of boiling the specimens to be determined in hydrochloric acid long enough merely to clean and etch the surface and then boiling in a second solution containing cupric chloride and hydrochloric acid. The 18-8 is supposed to take on a coating of copper and the 18-8 SMO should not be coated.

I have tried the experiment several times varying the concentration of cupric chloride and the acidity, with uniform lack of success.

I should appreciate it if you would give me any further details.

*ALBERT SCHNITZER*
*Schnitzer Alloy Products Co.,*
*164 Broadway,*
*Elizabeth 1, N. J.*

● Possibly your trouble originates in not using a reflux condenser. The boiling of the specimens in open beakers usually results in changes in the acid concentration, and to obtain a successful test, the optimum acid-water relationship is imperative. In the reflux condenser the vapor is condensed and runs back into the solution, thereby keeping the acid-water concentration uniform.—Ed.

## PRECISION CASTINGS

Sir:

We note in your Sept. 14 issue that information is requested on manufacturers on precision castings. We have been engaged in the manufacture of precision castings made by the lost wax process for some time and are producing castings of this type for a number of concerns such as International Business Machines, Bell Laboratory, Sperry Gyroscope, Republic Aviation, Eureka Vacuum Cleaner and many others. . . .

*WILLIAM H. SAYRE,*
*President*
*American Abrasive Metals Co.,*
*Irvington, N. J.*

## SPARK TESTING

Sir:

Have you any text books produced in America on spark testing? Can you suggest any persons I might correspond with in your country with regard to the segregation of alloy scrap and carbon scrap?

I would like to mention how I enjoy reading your various articles, which are extremely interesting.

*WILLIAM HALL*
*Thomas W. Ward, Ltd.,*
*Albion Works,*
*Sheffield, England*

● We have published several articles on spark testing and are sending you clippings. The problem of segregating alloy scrap from carbon scrap is dealt with in this country by the producer of the scrap and the consumer of the scrap. The broker or dealer in general functions simply as an intermediary. We suggest you communicate with L. D. Green, Bethelehem Steel Co., Bethlehem, Pa., and L. F. Reinartz, American Rolling Mill Co., Middletown, Ohio.—Ed.

## REFRACTORIES ERROR

Sir:

In checking through the manuscript of the article, "Steel Plant Refractories," I find that the last two columns in the last table have become switched. They should read:

| *Increase in Bulk Density Per Cent* | *Increase in Thermal Conductivity at 842 Deg. F. Mean Per Cent* |
|---|---|
| 6.2 | 6.95 |
| 9.5 | 16.90 |
| 14.8 | 30.60 |

I hope this will reach you in time to make the necessary alteration before going to print.

*J. H. CHESTERS*
*United Steel Companies, Ltd.,*
*Central Research Dept.,*
*Stocksbridge, Nr. Sheffield,*
*England*

● The letter was received too late to make the correction. Will readers who clipped and saved the article which began on page 42 of the Aug. 24 issue, please indicate that the figures should be transposed.—Ed.

## WHAT IS STAINLESS?

Sir:

Please explain the difference between stainless steel and carbon steel.

*E. R. SWANSON*
*Congress Hotel,*
*Omaha, Neb.*

● Stainless steel is usually one containing over, say, 10 per cent chromium. The average stainless steel in automobiles is about 14 per cent chromium. If the stainless steel must withstand severe corrosive conditions, the chromium is run up to about 18 per cent and nickel is added.

Ordinary carbon steel contains a fractional percentage of chromium or any one of a variety of other elements. That field of alloy steel between carbon and stainless types contains say 3 to 4 per cent chromium, some molybdenum and some nickel. These are the so-called engineering or structural steels used for gears, high strength machine parts, etc.—Ed.

## NON-FERROUS SPECIFICATIONS

Sir:

Would it be possible to obtain two copies of Non-Ferrous Alloy Specification sheets as printed in your Sept. 14 issue?

*D. W. LYNCH,*
*Works Laboratory, 25-B*
*General Electric Co.,*
*1285 Boston Ave.,*
*Bridgeport, Conn.*

---

Sir:

We are wondering if reprints of the detailed tables on Non-Ferrous Alloy Specifications are available. . . .

*W. M. RANDALL,*
*Research & Development Dept.*
*Colgate-Palmolive-Peet Co.,*
*105 Hudson St.,*
*Jersey City, N. J.*

---

Sir:

It is requested that three copies of Non-Ferrous Alloy Specifications be sent us.

*R. C. LEECH, 1st Lt., Ord. Dept.,*
*Library Officer*
*Watertown Arsenal,*
*Watertown 72, Mass.*

● Reprints are being made and will be furnished at cost.—Ed.

## QUALITY CONTROL

Sir:

I was interested in your Aug. 3 article, page 122, "Quality Control by Statistical Methods." In it are mentioned two publications, "Economical Control of Quality of Manufactured Product," and "An Engineer's Manual of Statistical Methods." Can you tell me where these publications can be obtained?

*A. M. RIDDLE*
*Colorado Fuel and Iron Corp.,*
*Denver, Colo.*

● "Economical Control of Quality of Manufactured Product," by W. A. Shewhart, is published by D. Van Nostrand Co., 250 Fourth Ave., New York, and "An Engineer's Manual of Statistical Methods," by Lt. Col. L. G. Simon, is published by John Wiley & Sons, 440 Fourth Ave., New York 16.—Ed.

## BENDING ALUMINUM ROD

Sir:

We have a few lengths of 9/32-in. round aluminum rod, 17 ST. We desire to make a right angle bend. Can we bend it cold or will heat treating be necessary?

*W. T. McCANDLISH*
*Allimac Stamping Co.,*
*P. O. Box 188,*
*Petersburg, Va.*

● Cold bending requires a radius in the bend of four to six times the diameter of the rod. If you anneal the rod the required radius drops from 0 to 9/32-in. radius of the bend.—Ed.

## CORROSION RESISTANCE

Sir:

Have you a chart on corrosion resistance of comparative materials?

*E. L. MAGNUS, Manager,*
*Rolling Mill Development*
*Signode Steel Strapping Co.,*
*2600 N. Western Ave.,*
*Chicago 47*

● We are sending you separately a reprint of the "Metals and Alloys Comparison Chart," which appeared in our May 30, 1944, issue. Comparative corrosion resistance is one of the points covered in the chart.—Ed.

# Wheelabrator

## ELIMINATES THESE HIDDEN TAXES IN METAL CLEANING

SPACE TAX
"Wheelabrator enabled us to remove eight tumbler mills thereby using the floor space they occupied to rearrange our grinding department, which was badly over-crowded."
TIME TAX
"The Wheelabrator turns out twice as much work as a sandblast and a quality of work much superior to the sandblast."
WASTE TAX
"Percentage of rejects has been greatly reduced and the item of breakage in cleaning process is entirely eliminated."
MANPOWER TAX
"We have saved 75% of our labor in cleaning and due to cleaner castings have saved the time of our cutters in cutting off gates and risers."

Certain present day taxes are inescapable—we all know that wars cannot be fought and won without them.

But others, particularly the taxes wrought by inefficiency, are largely inexcusable because modern equipment, if wisely selected, will usually pay for itself many times over.

The airless Wheelabrator does just that in the cleaning and finishing of metals . . . forgings, castings, heat treated parts, etc. . . . and, in addition, it eliminates many other taxes encountered in these operations.

The comments of a few users, printed above, are indicative of why more than 2,000 plants have modernized with Wheelabrator equipment.

Our engineering staff is ready to help you eliminate the hidden taxes on your cleaning problem. Send for complete information today.

**American**
**FOUNDRY EQUIPMENT CO.**
510 SOUTH BYRKIT STREET MISHAWAKA, INDIANA

*World's Largest Builders of Airless Blast Equipment*

# This Industrial Week . .

- **Steel Order Trends Mixed**
- **Future Freight Car Prospects Bright**
- **Scrap Composite Sags 92c. a Ton**

THE past week's trend in volume of steel orders was decidedly mixed. In Pittsburgh and Philadelphia shipments are ahead of new business. This has enabled producers there to slightly reduce backlogs. Contrary to those conditions, Chicago and Detroit indicate a high volume of fresh business.

This mixed trend condition, however, does not obscure the overall movement in the steel market which appears to be slowly downward. Product mix which has changed in some areas more than others is probably responsible for some changes. The falling off in demand for ingot and semi-finished steel has been reflected in mill order books at some locations. On the other hand, in those districts where there has been an abundance of business for flat-rolled products, the decline in total orders has not been so marked.

Probably more significant is the fact that the fourth quarter in the steel industry usually possesses elements of change. In normal times, October was usually a heavy order and production month and frequently was followed by a decline in new bookings and actual output. Some part of this set of conditions was due to inventory consciousness on the part of steel producers and consumers as the end of the year drew near.

There was evidence this week that the fourth quarter of this year will probably exhibit more normal tendencies than at any time since the war began. This year more than any time since before Pearl Harbor steel producers and consumers alike will, consistent with adequate supplying of war needs, reduce their inventories as much as possible. Hence, actual steel output this year may not be much ahead of 1943 production. At mid-year steel production in 1944 was about 1,165,000 tons ahead of the first six months of 1943. It is estimated that steel production for the first eight months of this year will be hardly more than a 1.000,000 tons ahead of the same period in 1943. A slump in order volume, coupled with cancellations and cutbacks in November or December of this year, could result in wiping out any accumulated excess in production so far this year over 1943.

EMPHASIZING the part which labor supply is playing on the reconversion front, implement makers have told their suppliers of material that there is little likelihood of a further increase in their production schedules until the middle of next year, unless the present labor shortage abates. This is significant because the implement industry has had virtually all production and material restrictions removed by WPB. Other civilian industries, given materials and release from limitation orders, may face the same prospect in the Chicago region.

The scrap market sagged again this week with price declines in major grades occurring at Pittsburgh, Chicago, Youngstown, Birmingham, Boston and Cincinnati. Consumers were conspicuous by their absence from the market, and the tendency to live off inventories continued this week. THE IRON AGE scrap composite declined 92c. a gross ton to $16.08 a gross ton.

National steel ingot operations have risen one point this week to 95 per cent of capacity. Pittsburgh output increased half a point to 93.5 per cent. In Cleveland the end of the Republic strike upped the ingot rate 32 points to 95 per cent. Wheeling production gained half a point to 91.5 per cent and in Birmingham the return of the brick masons to the Gulf Steel Works of Republic brought the rate up nine points to 94 per cent. In Detroit the steelmaking rate increased half a point to 104.5 and in the West operations have climbed to 92.5, a gain of three points. Declining operations have been reported in the following districts: Youngstown, down half a point to 93; Philadelphia, down one and a half points to 97; Buffalo, down three to 99.5; Cincinnati, down 14 to 95, and the Eastern district, down 12½ to 93.5. Chicago at 100 per cent and St. Louis at 92.5 continue unchanged.

CURRENTLY there are indications that adjustments are being made in rolling directives allowing some continuous mills which have been producing plates to shift to sheets in a larger measure. The object is to keep sheet backlogs which have been mounting from getting too far ahead of plates deliverywise. Slight leveling off in November and December Maritime Commission requirements have contributed to this readjustment. Despite the easing off in some steel lines and the release of pressure, there are still a number of isolated tight spots in the steel product market. Flat rolled carryovers are still heavy. The demand for galvanized wire is substantially ahead of production. Civilian producers who are operating under the "spot" authorization plan are having difficulty in obtaining spring wire. On the other hand, while warehouse demands continue strong, recent sympathetic treatment by WPB has resulted in stocks for most items being in good conditions.

Future locomotive and freight car prospects were bright this week. Requirements for 1360 locomotives for rehabilitation, in which the French provisional government was reported to be interested, have been slashed to 700. With the reported French freight car program of 74,500 cars, possible requirements for Russia, India and South America may be sufficiently substantial to swell the grand total to 115,000 cars. These requirements are still in the tentative stage and inquiries are not expected for some time. Furthermore, superimposing such a car program upon the railroad car-building industry when it would still be producing units for the Army and for domestic purposes would be more or less of a useless gesture until the more urgent programs were completed.

• **FABRICATED STRUCTURALS**—August bookings of fabricated structural steel for bridge and building construction reported to the American Institute of Steel Construction by companies representing 75.9 per cent of the total average of the industry during the years 1923-1925, totaled 40,229 tons. This figure compares with 77,371 tons for July, and 37,563 tons for August of last year. August shipments for bridge and building construction totaled 44,118 tons as compared with 50,229 tons reported for the same month last year. The reported tonnage available for future fabrication on Aug. 31 was 130,376 tons.

• **ALLOY STEEL OUTPUT UP**—Production of alloy steels during August totaled 874,716 tons, about 12 per cent of total steel production during that month, according to the American Iron & Steel Institute. In July 854,321 tons of alloy steel were produced. In August a year ago alloy steel production was 1,097,630 tons. Open hearth furnaces produced 576,690 tons of alloy steel in August. The remaining 298,026 tons of alloy steel production came chiefly from electric furnaces.

• **PIG IRON SUPPLIES**—Evidence seems to be increasing that pig iron supplies are becoming more plentiful each month. Output in August represented about 90.2 per cent of rated blast furnace capacity compared with 91 per cent in July, according to the American Iron & Steel Institute. Probably more significant is the fact that the Mystic furnace in the East has been banked "temporarily." This is a merchant furnace and probably indicates a condition which is common to other pig iron producing districts. Mystic has enough iron on hand, based on the current rate of shipments, to carry on for some months.

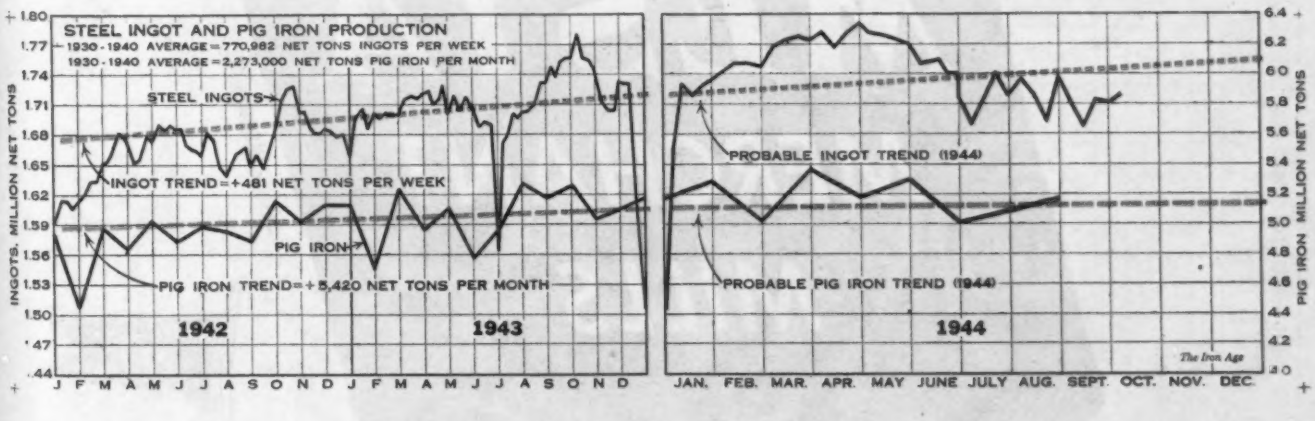
• **SHIPBUILDING STRIKE**—A strike of 150 crane operators last week at the Kearny, N. J., Federal Shipbuilding & Drydock Co., delayed the building of vital warships and reduced operations considerably. The strike of these operators makes thousands of other employees idle. The strike was settled early this week. Demands of the crane operators were unique. They wanted a guaranteed 48-hr. work week, regardless of weather, or operating conditions and demanded that there be no further reduction of force at either shipyard. The men returned to work after an order to them from the Shipbuilding Commission of the National War Labor Board.

• **CIVILIAN CONSUMER GOODS**—J. H. Ashbaugh, vice-president, Westinghouse Electric & Mfg. Co. and manager of its Appliance Division, has predicted that production of civilian consumer goods will not start until at least six months after the defeat of Germany. He did not question that there would be plenty of material available, but he did argue that it will take time to get it in suitable form. He pointed out that it will require about four months to get material, one month to fabricate parts, and production should start in the fifth or sixth months. In citing a recent cost analysis of a Westinghouse product which originally cost $25 to make, but would now cost $35, or an increase of 35 per cent, Mr. Ashbaugh said that in the analysis was overtime, rearrangement, training expenses and other items of cost not of a normal nature. When those items were eliminated it was found that the increase in cost was 21 per cent. Of this increase, 50 per cent is for labor, 30 per cent for material and 20 per cent for overhead, caused mainly by clerical force load necessary to keep up with governmental accounting and other regulations. This increased cost will have to be reduced by improved manufacturing, it was said.

• **POSTWAR PLANES**—An additional contract for postwar delivery of 15 four-engined DC4 transport planes valued at approximately $10,000,000 for Pennsylvania Central Airlines has been announced by Donald W. Douglas to add to Douglas Aircraft Corp.'s postwar commercial backlog which is now over $60,000,000, in contracts signed within the past month. Production will be at the original Santa Monica Douglas plant.

• **ALUMINUM BOX CARS**—Reynolds Metal Co. has sold 30 "aluminum" box cars in lots of 10 each to the Rock Island, Alton, and Minneapolis and St. Paul railroads. Actually because such important structural portions of the cars as underframes and trucks are of steel, there will be 29,000 lb. of steel as against 7500 lb. of high strength alloy aluminum in each car. Total weight saved is about 10,000 lb. each over steel cars. Twenty of the cars are designed for operation in regular passenger trains and will be equipped with regular passenger braking equipment. The light weight design lowers the center of gravity and permits operations of the cars in high speed trains. Reynolds also is active on design of other types of railroad freight cars.

The Iron Age




## *Steel Ingot Production by Districts and Per Cent of Capacity*

| Week of | Pittsburgh | Chicago | Youngstown | Philadelphia | Cleveland | Buffalo | Wheeling | South | Detroit | West | Ohio River | St. Louis | East | Aggregate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| September 26.. | 93.0 | 100.0 | 93.5 | 98.5 | 63.0 | 102.5 | 91.0 | 85.0* | 104.0* | 89.5 | 109.0 | 92.5 | 106.0 | 94.0 |
| October 3..... | 93.5 | 100.0 | 93.0 | 97.0 | 95.0 | 99.5 | 91.5 | 94.0 | 104.5 | 92.5 | 95.0 | 92.5 | 93.5 | 95.0 |

* Revised

MESTA 21"—18"—14"—10" MERCHANT MILLS,
WITH PACK ANNEALING COOLING BED AND EQUIPMENT

# MESTA MERCHANT MILLS

The Army-Navy "E" Flag with four stars, flies over the Mesta Plant.

MESTA MACHINE COMPANY · PITTSBURGH, PA.

# Postwar Prospects Rouse Prefabricated Housing

By T. W. LIPPERT

o o o

• • • **Today, a great many factors** join to promise a really big real-estate boom and surge in new residential building in the immediate postwar period. All the planners and promisers — private, governmental, and miscellaneous—are so fascinated with this potentiality as the keystone to postwar recovery, that they brush aside such irritants as "who," "how," and "where." Even Henry Kaiser, that enlightened capitalist, has examined the problem with such typical skill and insight as to startle established builders. "Housing," he says, "is the greatest of all the fields of progress. All that is needed is a little imagination. Why do they have to build a group of houses that all look alike? Make 'em different and attractive and livable. Then they can be sold or rented."

As seen by the graph on this page, 1925 was the all-time record year for residential construction, with 937,000 housing units accounting for almost 60 per cent of total construction. At that time about 80 per cent of the dwelling units was in urban areas, the average cost of the units being close to $4500. During the depression, construction costs fell, but it became cheaper to buy foreclosed property rather than to build. Consequently, the volume of new building dropped abruptly. As a result, there was considerable deterioration in the "stock" of houses, and the modest building spurt which gained momentum in 1935-36 was insufficient to replace the deficit.

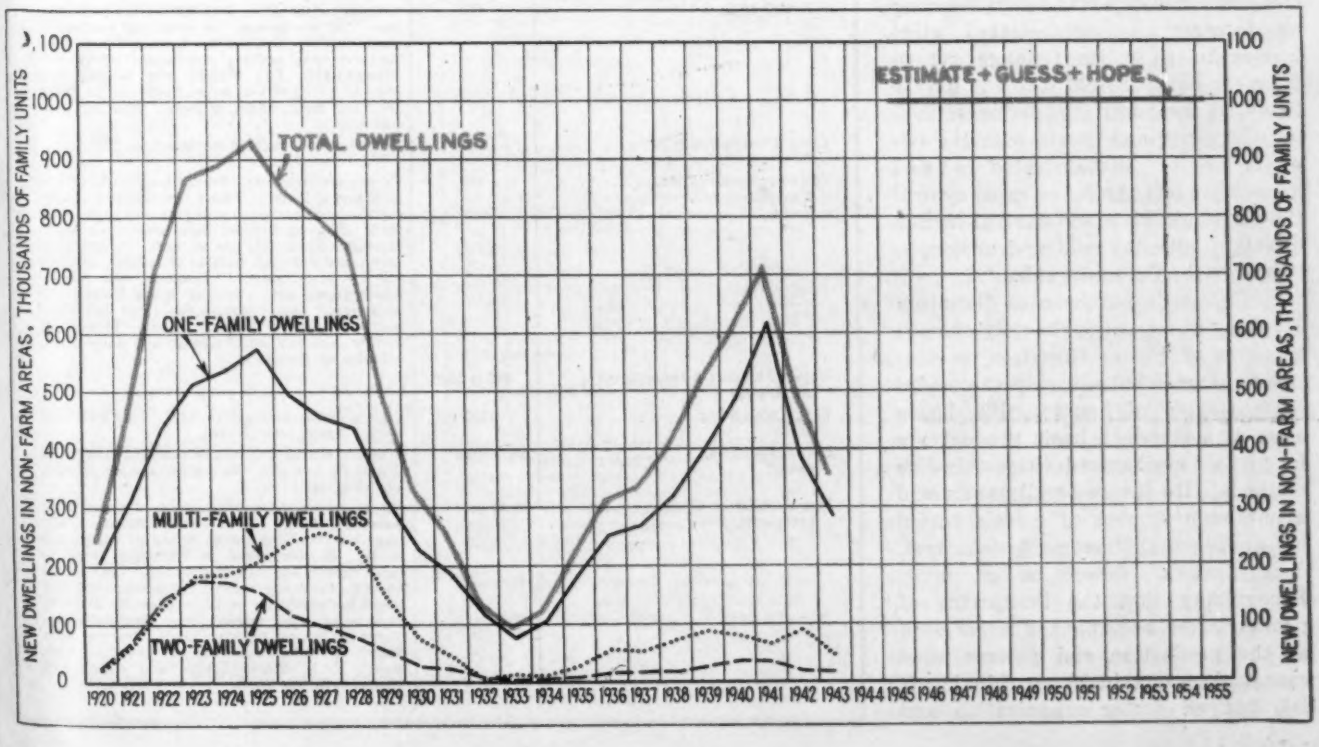
A most significant product of the depression was the revision of mortgage lending practice through establishment of the Federal Housing Administration in 1934. Under the FHA the single, long-term, amortized mortgage of standardized terms, classified according to risk, widely replaced the brutal system of multiple short-term unamortized mortgages of widely varying quality and terms. FHA will contribute materially in the postwar period that will facilitate the expected building boom, what with its lower initial payments, regular monthly payments geared to ability to pay, and protection against premature withdrawal of mortgage funds.

Since Pearl Harbor almost 50 per cent of the building has been in the hands of the government. Since the impelling force in wartime construction has been population shifts, the government has been forced to handle construction in those areas where the need was deemed too temporary to be met by private builders. Even so, about 30 per cent of the government units are considered permanent and may well be used for slum clearance after the war. A complicating issue is the manner of disposal of the remainder of the government housing units, on which no announcement has been made. Both private and government building over the past three years has been inferior, because of materials limitations and labor shortages.

Out of the available welter of data

---

UP, DOWN, UP, UP: *Even though the war stopped the construction of private dwellings, emergency housing has kept total family units far above the depression nadir. Every postwar planner has embraced a super-building boom as a keystone of recovery, but if the super is not super enough the building of housing may well become a favorite for a future government make-work program.*



emerges the following rough range of prediction for housing in the postwar period. The number of units required each year in the first ten postwar years, to house the net growth in the number of families (seven million, or thereabouts), to meet migration, and to replace worn-out housing, may run anywhere from 500,000 to 2,000,000, with most estimates in the area of 1,000,000. More than half of these dwellings, about 600,000 units, will lie in the area of persons who could pay $40 a month or more for rent or carrying charges; another 30 per cent, or 300,000, in the area of those who could pay $20 to $35 a month; and 20 per cent in the area of those who could pay $18 or less a month.

Most of the units in the first and second areas will be built by private industry following accepted architectural designs, with a possible minor fillip from a little prefabrication and new materials. The remainder of the second and all of the third area represent that field to be dominated by prefabrication and possible subsidization and government participation. The prefabrication will likely vary from wooden structures in panel or pre-cut form, which follow conventional architectual patterns, to all-steel monstrosities of the grain-bin type for the sharecropper trade.

The volume of postwar housing, be what it may, will return to the metals industry a little over one ton of material per housing unit. The recent acquisition of Gunnison Housing Corp., New Albany, Ind., by the U. S. Steel Corp. led to some comment that the steel industry was again reviving an interest in prefabricated steel houses to raise its tonnage return from the housing field. This is hardly likely, as some brutal experiences during the depression years with the exploitation of prefabricated steel houses has left the industry so cynical that it would view any revival in this direction with the cold and unsympathetic stare of a sand crab.

U. S. Steel's purchase of Gunnison Housing Corp. was primarily the acquisition of Foster Gunnison, a relative newcomer but a highly successful prefabricator of houses. His house aims at a standard basic product via highly mechanized assembly-line methods. He favors small panels and a minimum number of models varied by architectual treatment (shutters, door frames, flower boxes, etc.). Recognizing that the limitations of prefabricated housing has never been at the production end (where most casual observers insist on thinking it is), but on dealer organization and

## Major House Prefabricators Using Wood, Plywood, Gypsum Board and Similar Material As a Chief Material

| Name and Location of Main Office | Stated Monthly Capacity | Remarks |
|---|---|---|
| Aladdin Co., Bay City, Mich. | 1000 | Producer of over 100,000 pre-cut houses and summer cottages for 30 years. Pre-cut material shipped at same freight rates as unworked material. Claims 15 to 20 percent savings in materials and 15 per cent in erection labor. Flexible plans and designs, with appearance of conventionally built houses. Has kept pace with architectural progress. Sells by direct mail catalogs and national advertising. Handles construction period financing and carries own paper. No trouble with labor unions to date. Has refused to bid on FPHA housing projects. Expects to continue pre-cut method in postwar period. |
| American Houses, Inc., New York | 2500 to 4000 | Orders as of 1/15/44 totaled 2240 houses. Fabricating plants located at site of major projects and are moved as required. Organized in 1923 to manufacture steel houses, but after spending substantial sums, decided to concentrate on wooden structures. Operated at a profit in 1941, 1942, and 1943. Sales for 1943, $2,200,000. Entire preferred stock held jointly by American Radiator and General Electric. These companies, together with American Houses, formed Houses, Inc., which acts as sales agency for prefabricated houses. Engages in manufacturing only. Houses are assembled by contracters. Holds many basic patents; some are widely licensed. Wholly-owned subsidiaries are: Century Houses, Inc. (prefabricated houses, Fort Worth); Century Construction Co. (construction, Fort Worth); Arthur Olson, Inc. (construction, New York City); Fairhaven Gardens (real estate development, New York and New Jersey). |
| Bank Building & Equipment Corp. of America, St. Louis | 375 | Started prefabricating in 1942. Has worked largely on housing projects. |
| Barrett & Hilp, San Francisco | 960 or more | Entered prefabrication field in 1941. Site prefabricators. Have built partly Homosote houses. |
| Henry C. Beck Co., Dallas | Said to be unlimited, probably at least 1000 | Site prefabricators operating in southern states. |
| Bennett Lumber Co., North Tonawanda, N. Y. | Not stated | Established producer of pre-cut houses of conticnal design. Covers $3500 to $20,000 field. Has produced panelized war houses. Expects to enter this field, in addition to pre-cut, in postwar period. |
| E. L. Bruce Co., Memphis | 200 (to be increased to 500) | Entirely war housing. Primarily lumber dealer. |
| Clinton G. Bush Lumber Corp., New York | Not stated | Heavy contractors: handled numerous contracts for war housing and barracks. No postwar plans. |
| Evans Products Co., Detroit | Not stated | Has built panel-type war houses for projects in California and Virginia. Owns large forest tracts and lumber and plywood mill in Oregon. Plans to ship prefabricated plywood panels to all U. S. points from Oregon mill. Expects to work through wholesale lumber dealers. |
| General Fabricators, Washington | 750 to 960 | Factory prefabricators using Masonite. |
| General Homes, Inc., Washington | 600 | Factory prefabricators, in business for some years. |
| Green Lumber Co., Laurel, Miss. | 600 | Factory prefabricators since 1941. Has built more than 1000 war houses. Is considered amateur at prefabrication. Owns timber lands and large plant for processing building materials. Works with Algernon-Blair Co., Mobile, who handles field erection. Had serious union trouble at La Porte, Ind., and Biloxi, Miss., projects. Uncertain postwar factor. |
| Green's Ready-Built Houses, Rockford, Ill. | 150 | Factory prefabricators in business since 1941. |
| Gunnison Housing Corp., New Albany, Ind. | 600 | Factory prefabricaters. Started business in 1936 at insistence of Owen D. Young. Investigated existing prefabricaters and concluded none was on the right track. Aims at standard basic product via highly mechanized assembly line methods. Favors small panels and minimum number of models varied by "architectural treatment" (shutters, door frames, flower boxes, etc.) Stresses highly trained and wide-spread dealer organization (1500 minimum) built along lines of General Motors. Thinking of four or five additional factories and several distribution warehouses. |
| Hayward Lumber & Investment Co., Los Angeles | 500 to 1000 | |
| E. F. Hodgson Co., Boston | 1500 | Factory prefabricaters since 1892. Had built over 100,000 houses prior to 1942. |
| Holt-Fairchild Co., Boston | Not stated | Produced war houses. Has dismantled factory and looking for new site. No postwar designs or plans available. |
| Homosote Co., Trenton, N. J. | None | Manufacturers of insulating board. Licenses other builders. Started "Own-A-Home Savings Club" idea; has exhibited model homes in department stores. Designs based on Homasote board as rough exterior and intsrior sheathing. Outside can be finished with any material. Requires no studding insulation; eliminates inside condensation problem. Expects to work through large distributor-contractors. Claims to have deals arranged with Barrett and Hilp (San Francisco and New York areas), E. L. Bruce (South), and Kuhne and Simmons (Middle West). |

## Major House Prefabricators Using Wood, Plywood, Gypsum Board and Similar Material As a Chief Material—Continued

| Name and Location of Main Office | Stated Monthly Capacity | Remarks |
|---|---|---|
| Home Building Corp. Kansas City | 250 | Factory prefabricators. |
| Houston Ready-Cut House Co. Houston, Texas | 600 | Both factory and site prefabricators. Founded 1917. Had built 12,000 units prior to 1942, many of which were war housing projects. Planning for postwar minimum house, suited for southern climate, for $1700 to $2800 field. |
| Hussman-Ligonier Co. St. Louis | 350 | Established 1921. Factory prefabricators. |
| Illinois Lumber Manufacturing Co. Cairo, Ill. | 300 | Factory prefabricators. |
| John A. Johnson Contracting Corp. Brooklyn | 500 | Factory prefabricators which entered housing field in 1941. Successful in heavy construction field. Produced 3000 to 4000 prefabricated war houses and many barracks. Built Fort Dix in 1940. Established plant at Pemberton, N. J., for panels. Aims at $3000 to $4000 field. No definite postwar plans. |
| Johnson Housing, Inc. Sharon, Pa. | 240 | Factory prefabricators. |
| T. C. King Co. Anniston, Ala. | 500 | Established wholesale and retail lumber distributor. Factory prefabricators since 1935. Built 10,000 units before 1942, and has built 1000 or more war houses since that time. Expects to continue in postwar period with minimum house using 2-ft. panels. |
| M. B. Kolb Co., Inc. New York | 350 to 400 | Established in 1910. Now entirely on war housing. |
| Libby-Owens-Ford Glass Co. Toledo | 360 to 600 | Factory prefabricators. |
| Robert McCarthy Co. San Francisco | 100 | War jobs only. |
| National Homes Corp. Lafayette, Ind. | 750 (plans to raise to 1020) | Established in 1940 and operated by three former Gunnison officials. Assembly line fabrication of wood frames and plywood frames. Favors large prefabricated sections instead of panels. Before war offered 14 different designs. Had built 3000 houses by mid-1943. Aim at $3000 to $5000 field, working through dealer-contractors with sight-draft delivery. Organized under A. F. of L. |
| Niagara Realty Corp. Brooklyn | 200 | Factory prefabricators. Recently established. |
| P. H. C. Housing Corp. Jackson, Miss. | 500 (proposed capacity) | Manufactures standardized assemblies for use in house of any size or shape. |
| Pease Woodwork Co., Inc. Cincinnati | 125 to 250 | Factory prefabricators. Entered business in 1940. Long established mail order builders' supply house. Excellent customer list. Operates on a cash basis, has not sold FPHA by preference. Designs based on large panels with outside sheathing applied on the site; looks like conventional house. Claim double air space eliminates condensation problem prevalent in panel design. Aims at $4000 to $5000 field, working through dealer-contractors on sight-draft basis. Claim costs 20 per cent below conventional construction. Considered postwar factor because of excellent product and established customer list. |
| Plywood Structures. Los Angeles | 500 | |
| Prebuilt Company. Revere, Mass. | Not stated, probably at least 200 | Has produced portable panelized cottages, garages, chicken coops, etc., since 1920. Entered housing field in 1930. Handled numerous war housing projects in New England. Aims at $2000 to $3000 field in postwar period. |
| Prefabricated Products. Seattle | 750 | Factory prefabricators. |
| Sears-Roebuck Co. (Norwood Sash & Door Company) Norwood, Ohio | 300 | Factory prefabricators. |
| Southern Mill & Mfg. Co. Tulsa | 900 | Large wholesale and retail outlet for building supplies. Factory prefabricators of portable houses for the oil fields for past 20 years. Favors a plant at building site. Design based on 4-ft. panels of plywood. Has established postwar planning unit. Has hired former FPHA engineer and architect. |
| Speedwall Co. Seattle | 150 | Factory prefabricators. |
| Stout Houses, Inc. Detroit | Not stated | Has produced war houses for Detroit projects, also completely demountable 12-bed hospital units for military use. Aims at minimum house, $1500 to $2000, with flexible design permitting future enlargement, also removal to another site. |
| Tennessee Valley Authority, as Agent of National Housing Administration. Knoxville, Tenn. | Not stated, probably large (at least 500) | Factory prefabricators. |
| Texas Prefabricated House & Tent Co. Dallas | 15,000 (should be discounted as the house is more nearly a wooden tent) | Produced many war houses at cost of $1000 or less. Used a basic 16x16-ft. unit completely demountable. Aims at Southern markets; thinking of a house for every sharecropper and tenant farmer at a cost of less than $1000. Design is cheap, utilitarian, and has a life of three to four years. |
| Travelodge Corp. Lynchburg, Va. | 840 | Factory prefabricators formed in 1940. |
| Upson Co. Lockport, N. Y. | ..... | Manufacturers of building and insulating board. Supplies Bennett; Bush; Sheboygan-Wisconsin Prefabricators; Norwood; and Bell. Booster for prefabrication. |
| Total Capacity (excluding Texas Prefabricated House & Tent Co.) | 20,040 to 22,605 | |



location of factories, Gunnison has for the former built a widespread group along the lines of General Motors, and to solve the latter plans four or five additional factories and distribution warehouses. There is no likelihood that Gunnison will welcome or that the U. S. Steel Corp. will attempt to force the widespread use of steel in the postwar house models. Rather, the designs will continue to follow conventional patterns, with Corporation research and raw material facilities serving to back up greater praticipation in the postwar market.

The accompanying table shows past and present producers of prefabricated steel houses. While the postwar period may find some of these companies, or new companies, attempting to capture some of the low-price market, the unmistakable preference of buyers for a conventional appearing wooden house will serve to keep postwar prefabricated housing activities mostly in the realm of those producers tabulated here. Of all these prefabricators, by far the most successful has been the Aladdin Co., Bay City, Mich., a producer of pre-cut houses of conventional appearance and design. Established in 1909, this company is owned and controlled by the Sovereign family, and paid substantial dividends until 1939. Its line of houses varies from $200 to $3000, it carries its own paper on installment financing, and has plants in Bay City, Mich., and North Portland, Ore.

In England the government has come to the conclusion that there would be a serious shortage of family accommodation at the end of the war before permanent housing could meet even the most urgent part of the housing demand. Early this year the government decided that temporary houses of some kind would be necessary.

There was no question of concentrating on one form of construction for the whole of this emergency operation. What was necessary, in the first place, was to find an industry capable of very large scale production at the earliest date and able to rely on an adequate supply of materials. The group selected was the pressed steel industry. It was in relation to the resources of that industry that the Portal house, or bungalow, had been designed.

There would be at least five firms who would take part in the production. Two, Briggs Motor Bodies and the Pressed Steel Co., would provide the bulk of the carcasses and the partitions. Among the main contractors for the fittings would be Fisher &

Ludlow, Ltd., Sankey-Sheldon, and Rubery Owen. All of these concerns were at present taking part in war production and maintained a most accurate system of costs. The cost of the proposed bungalows would be of the order of $2400 each. Of the $2400, $400 would be for the services in erection and transport, $400 for the kitchen unit and repairs, $1600 for the carcass, roof, ceilings, partitions, lining material, doors, insulation, paint, and other fittings.

Negotiations are also taking place in regard to the Weir house, a permanent steel dwelling, and when the discussions are finished instructions would be given for building.

The sheet manufacturing capacity of the British steel industry is about 1,500,000 tons a year. The construction of Portal houses at the rate of some 100,000 a year would absorb more than 400,000 tons of sheets. In comparison, the production of motor cars at the prewar rate of about 350,000 a year required some 140,000 tons of sheets. There will, of course, be demands from many other sheet consuming industries, such as tinplate, and it is quite possible that the supply of steel sheets will be inadequate to meet all demands.

**Major House Prefabricators (Past and Present) Using Steel As a Chief Material**

| Name and Location of Main Office | Stated Monthly Capacity | Remarks |
|---|---|---|
| American Rolling Mill Co., Middletown, Ohio | Unknown | Now out of house business. From 1933 to 1936 produced a number of experimental units. |
| Brooks-Skinner Co., Quincy, Mass. | Unknown | In business for some years. Chiefly build garages and light commercial structures. Also large builders of pre-cut wooden buildings of conventional design. Handles own financing. |
| Butler Mfg. Co., Kansas City, Mo. | Unknown | Now concentrating on military structures. Built about 100 Dymaxin steel grain bin houses. |
| Diebold Safe & Lock Co., Canton, Ohio | Unknown | Prefabricated some residences. |
| General Houses, Inc., Chicago | 500 houses | Began production in 1932 of steel frame houses covered on outside with sheet steel frames and on inside with sheet steel or composition board. |
| Great Lakes Steel Corp., Stran-Steel Division, Detroit | Unknown | Steel frames residences. So far chiefly promotional installation. Little success in individual houses; some success in group housing projects; great success in military housing. |
| Harnischfeger Corp., Milwaukee | 300 houses | Factory prefabrication since 1935 of wall, floor, and roof units consisting of steel studs covered with insulation board or plywood. |
| Hobart Welded Steel House Co., Troy, Ohio | Unknown | Present output limited by priorities. Have built 75 all-steel prefabricated houses. |
| Juul Steel Houses, Sheboygan, Wis. | 180 houses | Output limited by restrictions on steel. About 100 houses built with pressed steel panel framing. |
| Soule Steel Co., San Francisco | 500 houses | Now out of production. About 15 houses built of steel sheets and strip. |
| Tennessee Coal, Iron & Railroad Co., Birmingham | Unknown | Panelbilt structures; now out of production. |
| LeTourneau Company of Georgia, Inc. (Tournapull Housing Corp. Division) Tournapull, Ga. | Unknown | Factory prefabricated steel houses. About 250 houses built. |

# *First Army-Navy Repricing Order Issued under 1943 Revenue Act*

***Washington***

• • • **The first application** of a repricing order, issued jointly by the Army and Navy, was announced recently by the Navy Department, and was attributed to failure to reach satisfactory agreements with the Lord Mfg. Co., Erie, Pa., maker of rubber engine and instrument mounts for aircraft. The drastic action taken is provided for in Title VIII of the Revenue Act of 1943. Under it the Army and Navy, when unable to agree with war producers upon reduced prices are authorized to fix "fair and reasonable prices."

Navy officials said that the emergency buying at the start of the war did not permit making close price studies. But once the emergency leveled off and production was assured, they pointed out, it was customary to re-evaluate prices on the basis of experience with a reasonable profit to the manufacturer and most manufacturers then adjusted promptly. The Lord Mfg. Co. has, however, according to the Navy officials, "persistently refused to make any reduction in prices."

It was stated that a first attempt to renegotiate profits was made in 1942. The company, the statement said, refused to agree to proposals made by the Army Air Forces and reaffirmed by the War Department Price Adjustment Board, and the Undersecretary of War made a unilateral determination of excessive profits, it was explained, and the action is now in litigation in the Tax Court, Washington.

The Navy in April of this year, the statement continued, tried to reduce prices through negotiations but was forced to issue a mandatory order which compels a manufacturer so served to produce war materials at prices fixed by the Government. In May of this year, it was added, the Army Air Forces also issued a mandatory order to the company for products now being produced for the Army Air Forces.

The statement said that the company profits averaged about $80,000 before expansion through military buying. In 1942, Navy officials said, profits before taxes were more than $7,000,000 or approximately 100 per cent of cost and in 1943 over $12,000,000 or approximately 66 per cent of cost. This calculation is based on sales, which amounted to nearly $14,000,000 in 1942 and over $29,000,000 in 1943.

## Industrial Building Costs Remain Fixed in 3rd Quarter

*Cleveland*

• • • **Industrial building costs,** as measured by The Austin Company's quarterly index, remained at 122 during the third quarter. This compares with an index figure of 115 during the same period last year.

"Building costs now appear to have reached a level which is not likely to be exceeded during the war period unless general wage and price ceilings are removed," George A. Bryant, president of the national engineering and construction organization, said in commenting on the index.

# Law Laughs at Justice As Steel Wage Case Stumbles Along

• By DONALD BROWNE •

*Washington*

• • • The standards of American administrative justice hit a new low as arguments of the union and the companies in the steel wage case were presented to the War Labor Board on Sept. 27 and 28. Closing arguments will be heard on Oct. 4 and 5.

Conscious that political expediency will be the weightiest factor in any decision by the Board and the President, USWA President Philip Murray threw the political strength of 1,000,000 union members into the balance, as he baldly made the forthcoming election the major issue before the Board.

Steel Research Committee Chairman John A. Stephens was given the choice of arguing the issues on the basis of the facts, or fighting fire with fire by presenting political arguments on behalf of the companies in trying to win the case which was prejudged in favor of the union before it was instituted last spring.

Crying that the case has been made a "political football," Mr. Murray urged the Board to "decide the case on the facts and evidence" and not to "heed the diabolical undermining of groups who would attempt to thrust a bread and butter issue into the realm of national politics."

Then thrusting the issue into the realm of politics, Mr. Murray stoutly maintained that the board should disregard the "importunities of those who publicly seek to create national confusion" by making the case a political question.

A strike threat was implicit in Mr. Murray's discussion of the union's strike forbearance. Mr. Murray said that the union would continue to keep its no strike pledge, however, despite the "advantage taken by some employers who have refused to negotiate settlements of disputes through grievance machinery provided by collective bargaining contracts."

He savagely attacked "wage freezing" and "wage regimentation" and pointed out that in the more than six months and three weeks the case was before the Steel Panel the union had consumed only three and a half days' time while the companies were allowed by the panel to delay the panel report by occupying the rest of the time.

The only reason the Little Steel Formula was accepted by the union was the administration's promise that the cost of food, clothing and other items would be stabilized, Mr. Murray said. This has not been done, he added.

All this harangue brought no rebuke from WLB Chairman William H. Davis, who listened interestedly.

Countering the union chieftain's arguments, Mr. Stephens showed that he knew what sort of a situation he had to deal with because he reminded the Administration by quoting the principal figures in the stabilization program, the President, War Mobilizer Byrnes, OPA Administrator Chester Bowles, Economic Stabilizer Vinson, War Food Administrator Jones and WLB Chairman Davis as they have repeatedly reiterated the desirability of retaining the little steel formula and "holding the line." Mr. Byrnes restated this position as late as last week before the National Press Club.

Mr. Stephens also said:

"May I observe that the companies expect that all issues in this case will be determined under the rules in effect now and which have been in effect during the progress of the case.

"These rules and the precedents created by your decisions, cannot in equity now be changed to permit in one way or another an appeasing concession should the inevitable conclusion be shortly reached that no modification of the steel formula can be recommended."

Mr. Stephens invited the Board to postpone decision until the steel industry has returned to a peace-time basis and pointed out that steelworkers have already received wage increases double the rise in the cost of living since January, 1941.

On the previous day, Mr. Murray pleaded with the Board to consider the case on the merits of the evidence and the conditions which have existed in the past 10 months rather than the uncertainties which will come about with the defeat of Germany, because no one knows when "V-E Day" will happen.

"Balderdash, poppycock and piffle" was the way Mr. Stephens described Mr. Murray's implication that the Panel had connived with the companies to postpone decision in the case for months.

In spite of the fact that Mr. Murray asked for an immediate transmission of the Board's recommendations in the case by Oct. 15 to the President, as is now scheduled and is feared will happen, X-Day may come before the President's decision, he shrewdly seized the opportunity to make public for OPA the controversial Gilbert report. This report says that the return to the 40-hr. week after X-Day and downgrading of workers would result in such savings to the steel companies that they would be able to absorb the cost of paying all of USWA's demand for an additional 17c. an hr. without receiving an increase in steel prices.

WLB Chairman Davis ordered Mr. Murray's reference to the OPA report

FLYING TANKS: *A light tank built by Marmon-Herrington in Indianapolis is revealed as the weapon carried into the invasion of Europe by the equally new British Hamilcar glider. The new all-welded tank was specially designed to be a part of the huge airborne army which opened the Normandy invasion and is playing an active part in operations in Holland.*

expunged from the record because it was not a part of the union's presentation before the panel and said that so far as the Board is concerned such a report never existed. This clever move on Mr. Murray's part succeeded in getting the prejudicial report before the Board and Mr. Davis' action had the effect of precluding the companies from attacking it.

The OPA report which Mr. Bowles has called "confidential," has been called "economically unsound" by OPA Deputy Administrator James G. Rogers, according to an OPA spokesman. No one outside OPA except a few favored newsmen, labor leaders and the public and labor members of the Steel Panel has seen the report.

As reported by Mr. Murray for OPA the report finds that:

"Since 1939, output per manhour has increased more than average hourly earnings. Consequently, labor costs are currently about four per cent below 1939 levels and 8.5 per cent below the average level for 1935-39.

"On the alternative and more realistic assumption that the wartime effects of upgrading and of premium payments will disappear from average hourly earnings and that costs of materials and services purchased will decline to 1941 levels, the break-even point is found at 35 per cent of capacity. Under these conditions, earnings at 50 per cent of capacity would be 78,000,000 and at 75 and 90 per cent they would be $240,000,000 and $347,000,000 respectively.

"If the wage increase were granted and the price increase denied—and if as is likely—average hourly earnings were to fall by reason of the elimination of overtime and upgrading and material prices were to decline to 1941 levels, the United States Steel Corp. would break even at 47 per cent of capacity. Earnings at 50 per cent of capacity would be $13,000,000; at 75 per cent $154,000,000 and at 90 per cent, $250,000,000."

Mr. Murray said the estimates were based upon data for the United States Steel Corp. which the report claims to be representative of the industry as a whole, but it is understood the report covers shipbuilding, cement plants and forging operations.

Lauson Stone, president of Follansbee Steel Corp., who spoke early in the case on behalf of small companies, told WLB that the cost of the wage demands would bankrupt little business. Similar statements were made by representatives of the Continental Steel Corp. and the Apollo Steel Co.

Research Committee Attorney Roger Blough attacked the panel's conclusion that the companies would be able to pay the costs of the wage demands and still earn more than was earned by the companies in the 1935-39 period. Chester McLain, another company attorney, urged the Board to recognize the relationship between the general wage increase and other demands. Dr. Jules Backman, research committee economist, discussed the inaccuracies of various costs of living reports introduced by the union.

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## FDR Confers on Little Steel Formula

*Washington*

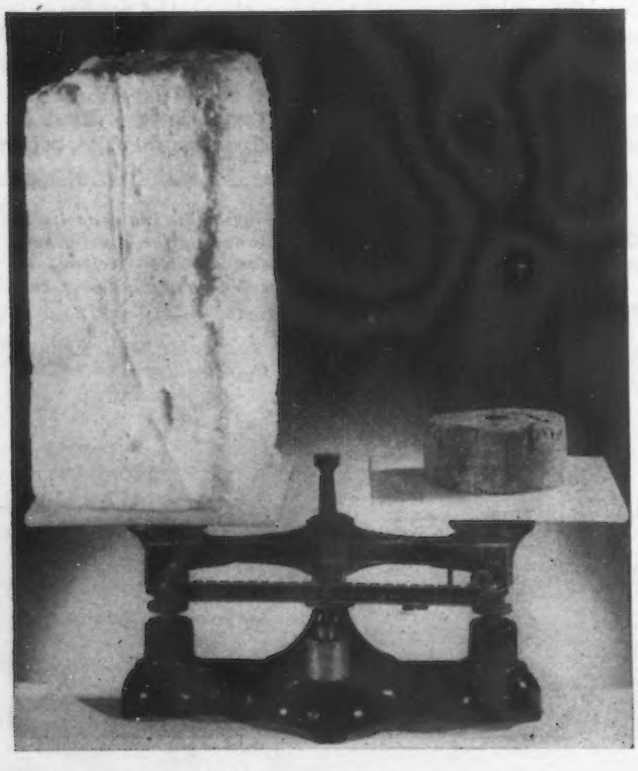
• • • **President Roosevelt** recently conferred with AFL President William Green and USWA President Philip Murray on breaking the little steel formula, and it is reported by labor sources that President Roosevelt asked a lot of questions but did not say when the formula would be broken.

The President is alleged to have discussed the political angle of granting the steel workers an increase and many observers feel that an announcement on the wage increase will not come until just before huge cutbacks are made on X-Day.

This would enable the White House to use the rationalization of a return to a 40 hr. week and down-grading of workers so happily provided by the OPA Research Division's report on the United States Steel Corp.

It is believed that the President was well acquainted with the union demands before calling the conference, and labor reports that Mr. Roosevelt said that the decision would not come until after Oct. 15 when WLB transmits its recommendations cannot be considered significant.

Labor leaders were said to have been disgruntled at the result of the conference but it is likely they were assured that the increases would come when most politically expedient.



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PLASTIC FOAM: *Development of a new plastic material, said to weigh only one-seventh as much as cork, by the U. S. Rubber Co. promises a number of postwar uses in various types of life-saving equipment. It is now being used for several war materials.*

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## Col. Gamble Returns To Wallace Barnes Sales Staff

*Bristol, Conn.*

• • • **Lieut.-Col. Jefferson S. Gamble** has returned recently to the sales staff of the Wallace Barnes Company division of Associated Spring, located here. Col. Gamble has just been released from the Army after two years with the Transportation Corps. Prior to that he served for a year with the War Production Board.

# Gray Iron Castings Meeting Scheduled to Discuss Postwar Plans

*Cleveland*

• • • **The role of the nation's gray** iron castings industry after the war, its prospects and problems of production, employment and marketing, are scheduled for preview at the peacetime planning conference and 16 annual meeting of the Gray Iron Founders' Society to be held in Cincinnati Oct. 10 and 11, with the Netherland Plaza Hotel as convention headquarters.

"A Look into the Future" is the theme of the conclave which will discuss, among other topics, contract termination from the viewpoint of the subcontractor, the importance of statistical data, future market possibilities, simplified cost controls, technical developments, mechanization and job evaluation.

Frank G. Steinebach, editor of *The Foundry*, will speak on "The Foundry Industry and the War" at the luncheon session Oct. 10 and at noon the following day the foundry executives will hear Brig. Gen. Henry J. Reilly, O. R. C., military authority, speak on the "Shadows of Coming Events."

The morning of the first day of the GIFS sessions will be devoted to discussion of the problems expected to arise from termination of war contracts, to analysis of the value of complete industry statistics, regarded as a postwar "must," and to an outline of the gray iron industry's possibilities and the planning to be undertaken to assure prosperous postwar growth.

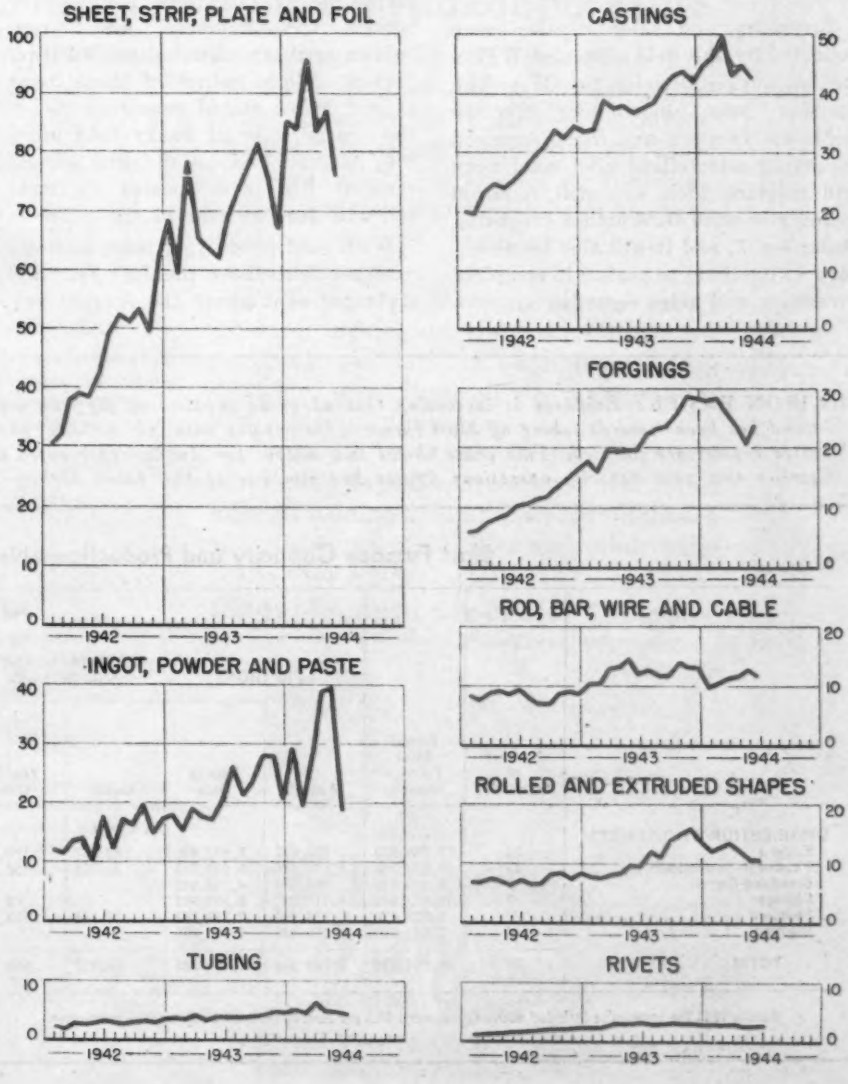
Walter L. Seelbach, secretary-treasurer of the Forest City Foundries Co., president of the national trade group, will greet the delegates and introduce as opening session speakers Lt. Col. Francis W. Parker, Jr., chief, training division, readjustment division, Army Service Forces, Washington; Owen C. Gretton, acting chief, metals, machinery, equipment and ordnance section, industry division, Bureau of Census; and Donald J. Reese, chief, manufacture and foundry products section, metallurgical branch, steel division, War Production Board, on loan from the International Nickel Co., Inc., New York.

Technical problems of the industry will highlight discussions of the afternoon session Oct. 10 with members of the society's technical committee forming an informational panel. Topics will include research, problems of castings development from the experimental stage to the finished product, management's responsibility in market development and its concern with technical problems. Panel members include Edward L. Roth, president, Motor Castings Co., Milwaukee, chairman; Frank J. Dost, superintendent, The Sterling Foundry Co., Wellington, Ohio; R. A. Flinn, Jr., research metallurgist, American Brake Shoe Co., Mahwah, N. J.; R. D. Phelps, Jr., secretary, The Francis & Nygren Foundry Co., Chicago; W. W. Levi, metallurgist, Lynchburg Foundry Co., Lynchburg, Va., and A. J. Edgar, technical adviser to the society.

Earlier in the first afternoon session Dr. Charles Reitell of Stevenson, Jordan & Harrison, Inc., New York, will speak on "Simplified Costs for Postwar Control."

During the morning of the second day the conference will hear discussions of mechanization from production and good housekeeping viewpoints; the annual report of W. W. Rose, the association's executive vice-president; and an analysis of gray iron castings markets and their directions of growth. Speakers scheduled for this session are, in addition to Mr. Rose, Kenneth Lange, foundry engineer, Link-Belt Co., Chicago; Lt. Comdr. Lester B. Knight, U. S. N. R., bureau of ships, Navy Department, Washington, and Edward C. Hoenicke, assistant to the general manager,

**ALUMINUM SHIPMENTS:** ***This chart, produced by the Aluminum and Magnesium Division of the War Production Board, shows the monthly shipments of aluminum fabricated products for the years 1942 to 1944. The quantities are indicated in millions of pounds. In practically all cases except forgings, the trend appears to be downward.***



foundry division, Eaton Mfg Co., Detroit, and former head of the gray iron castings section of WPB.

Following a talk by Col. W. B. Estes, management consultant, WPB, Cleveland, in the final general session, the conference will receive the reports of the society's standing committees and before adjournment members of the society will elect six new directors to serve three-year terms.

## 6000 Dealers Relieved Of Tedious Filing

***Washington***

• • • **Some 6000 dealers** in used machinery and machine tools whose estimated annual business in $500,000,000 have been relieved for at last 90 days of the burden of filing inventory and sales report. In announcing that these provisions have been suspended from Oct. 1 to Dec. 31, OPA said that action on future reporting requirements will be determined by the manner in which the industry maintains price control.

Inventory and sales reports were collected by the field offices of WPB's Redistribution Division for OPA. The division was disbanded, effective Sept. 30. Dealers and those engaged in buying and selling used machinery and machine tools are still required to register with OPA under Licensing Order No. 3, and it will also be necessary to continue to maintain complete inventory and sales records.

## August Figures Show Rise of Two Per Cent In Munition Production

***Washington***

• • • **Preliminary figures** on overall munitions output for August show a rise of two per cent above the July level, the War Production Board reported recently. Total output for July amounted to $5,300,000,000 — 96 per cent of the volume called for by the first-of-month schedule. August output totaled $5,430,000,000, or 97 per cent of the August goal.

A breakdown of August production by major munitions categories shows the following percentages of the first-of-month goals: Aircraft, 94 per cent complete; ships, 94 per cent complete; guns, 97 per cent complete; ammunition, 97 per cent complete; vehicles, 102 per cent complete; signal equipment, 97 per cent complete.

August output of the "trouble" programs showed several of the critical items reaching record highs—for example, heavy-duty tires, heavy-heavy trucks, super-bombers, and large-caliber artillery ammunition, WPB reported. While output of these items is still below stated requirements, in the special case of heavy field guns, the August production rate almost reached the level needed to meet schedule for the rest of the year.

WPB said production must average nine per cent above the July rate and eight per cent above the August volume in order to meet the present goal for 1944. WPB pointed out that, at the end of August, with two-thirds of the year gone, U. S. labor and industry had turned out 64 per cent of the total war equipment needed for 1944—$43,300,000,000 out of a year's requirement totaling $67,300,000,000.

Among the major programs, aircraft ($13,100,000,000 finished) and ships ($9,600,000,000 finished) are 66 per cent completed. On the other hand, ammunition, reflecting recent boosts in requirements for large caliber shells, is only 59 per cent completed.

## Passenger Car Facilities To Undergo Expansion

***St. Charles, Mo.***

• • • **Looking forward** to the modernization program now being planned by railroads for the postwar period, American Car & Foundry Co. has announced an expansion of passenger car building facilities at its St. Charles plant, building for railroads of the West and South.

The additions, which will comprise two one-story buildings of saw-tooth construction, covering 90,000 sq. ft., will include a new coach shop, a truck and forge shop. There will be 11 tracks, for setting 33 passenger cars of maximum length, and transfer tables for handling cars and equipment. These additions represent part of a program which will involve the spending of one and a half million.

**PIG IRON EASIER:** ***Evidence is increasing that adequate supplies of pig iron are no longer a problem. In some areas the trend has been towards taking off blast furnaces for repairs with no definite plans that some will go on immediately after repairs are finished. This chart shows that output for August represented about 90.2 per cent of rated capacity whereas earlier this year capacity operations figures had run one to two points higher.***

### Blast Furnace Capacity and Production—Net Tons

| | Number of Companies | Annual Blast Furnace Capacity | PRODUCTION | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | PIG IRON | | FERRO-MANGANESE AND SPIEGEL | | TOTAL | | Per Cent of Capacity | |
| | | | August | Year to Date | August | Year to Date | August | Year to Date | August | Year to Date |
| **DISTRIBUTION BY DISTRICTS:** | | | | | | | | | | |
| Eastern | 10 | 12,749,570 | 930,277 | 7,492,400 | 23,897 | 170,145 | 954,174 | 7,662,545 | 88.3 | 89.8 |
| Pittsburgh-Youngstown | 15 | 26,870,760 | 2,114,926 | 16,947,013 | 13,324 | 156,475 | 2,128,250 | 17,103,488 | 93.5 | 95.5 |
| Cleveland-Detroit | 7 | 6,620,500 | 518,571 | 4,185,532 | ..... | ..... | 518,571 | 4,185,532 | 92.4 | 94.8 |
| Chicago | 7 | 14,063,510 | 1,112,061 | 8,881,997 | ..... | 8,780 | 1,112,061 | 8,890,777 | 93.3 | 97.3 |
| Southern | 8 | 5,039,470 | 333,994 | 2,776,751 | 12,746 | 113,723 | 346,740 | 2,890,474 | 81.3 | 91.7 |
| Western | 4 | 2,841,100 | 150,426 | 1,115,840 | ..... | ..... | 150,426 | 1,115,840 | 62.5 | 67.2 |
| TOTAL | 35 | 68,184,910 | 5,160,255 | 41,399,533 | 49,967 | 449,123 | 5,210,222 | 41,848,656 | 90.2 | 93.4 |

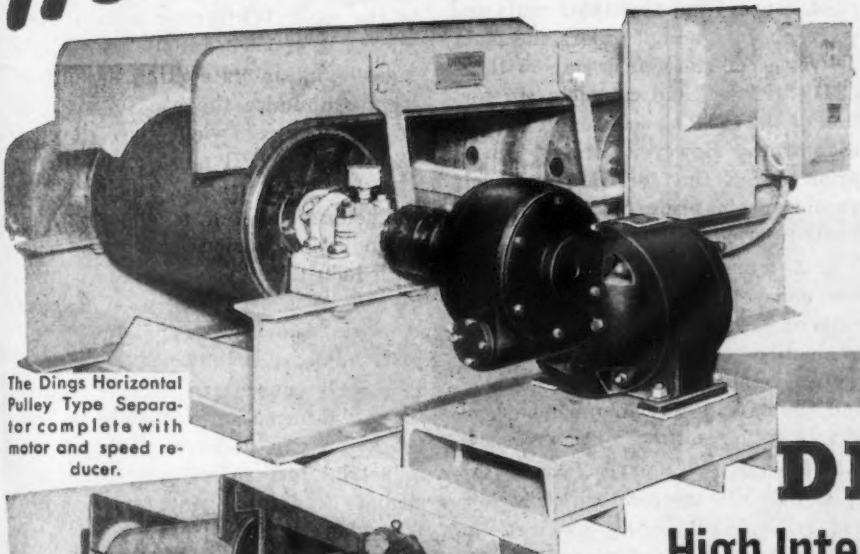
During 1943 the companies included above represented 99.5 per cent of the total blast furnace production.

# Here's FLEXIBILITY for

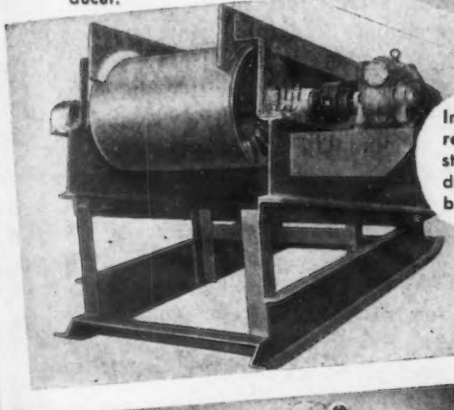
**Removing Iron from Foundry Sand**

**Separating Ferrous & Non-Ferrous Scrap**

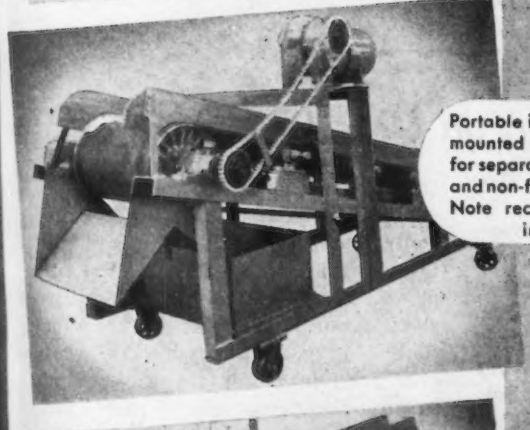
**Reclaiming Iron & Steel from Slag**



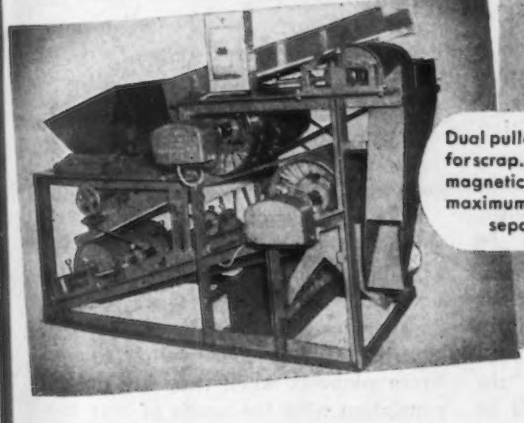
The Dings Horizontal Pulley Type Separator complete with motor and speed reducer.



Inclined Separator for reclaiming iron and steel from slag. Skids designed so unit may be dragged by tractor.



Portable inclined unit mounted on casters for separating ferrous and non-ferrous scrap. Note receptacle for iron.



Dual pulley separator for scrap. Employs two magnetic pulleys for maximum clean cut separation.

## DINGS

## High Intensity Magnetic Pulley Type Separators

Dings Magnetic Pulley Type Separators are completely self-contained units consisting of magnetic pulley, idler pulley, endless belt, frame, accessories, etc. They are available in horizontal or inclined, portable or stationery models for use with existing conveyor installations or as independent units.

Widely used throughout the metal working industries, they offer high capacity, dependability, economy of operation and great flexibility to meet widely varying requirements.

Dings High Intensity Magnetic Pulleys and Pulley Type Separators are described fully in catalog No. 250 which includes specifications, capacities and other data.

Ask for a copy.

**Dings Magnetic Separator Company**

516 East Smith Street, Milwaukee, Wisconsin

Alnico Horsehoe Magnet. 2½ in. high, 3 in. wide. ¾ in. x ¾ in. poles. Very powerful. Prices on request.

Dings MAGNETIC SEPARATION HIGH INTENSITY

# Krug Announces Tentative Plan For Revocation of Controls on V-E Day

*Washington*

• • • **Emphasizing that** it is only tentative, WPB Chairman J. A. Krug has announced a WPB Task Committee draft of the V-E Day plan, which proposes to revoke 350 out of the 500 control orders upon the defeat of Germany. Pointing out that there should be no spoon feeding of the economy, the report proposes that no attempt should be made to curtail individual initiative in the search for and purchase of materials and components that will remain in short supply for only a brief period.

No action, the committee said, should be taken that might hamper private enterprise or ingenuity. either by restricting members of an industry to historical pattern of business or by preventing entry of newcomers. Except for military requirements, which must be protected at any cost until victory over Japan is secured, it was pointed out, it is expected that essential needs will by and large be met without government control, either restrictive or supporting.

The 150 controls that are to be retained, according to the committee, will be greatly simplified. Of these 100 cover chemicals, textiles and forest products and 50 chiefly cover scarce metals and metal products. There are now about 200 orders applying to chemicals, textiles and forest products and about 300 other L, M, P, E, U and R orders covering different products, particularly metals and metal products.

The Task Committee draft has been distributed to other government agencies and to WPB divisions for comment and suggestions.

In addition to the foregoing the Task Committee proposed:

1. Replacement of the present preference rating structure by a single, fully extendable, MM rating band, reserved almost exclusively for direct military requirements, including military lend lease.

2. Continuation of the AAA preference rating, which will be used as at present to break military production bottlenecks, but also for civilian emergencies of a serious nature. This rating is tantamount to a motorcycle escort through traffic.

3. Authorization on V-E Day for steel, copper, and aluminum mills and warehouses to accept orders and make deliveries of these materials without CMP "tickets" and complete elimination of the CMP as soon as practicable thereafter. However, orders placed prior to V-E Day for CMP materials should retain preferred status for a limited period.

4. A transition to the new priorities policy that will combine a minimum of paper work and reshuffling of production schedules with necessary protection of military procurement and the earliest possible achievement of free action in the civilian economy.

5. Revocation on V-E Day of the great bulk of conservation, limitation, and other WPB orders and regulations; retention of orders in simplified form only where clearly necessary to protect military procurement or minimum civilian requirements basically essential to the effective functioning of the economy and progressive revocation of remaining orders as quickly as feasible.

6. Maintenance of a full kit of tools to deal with emergencies. The committee recognizes that military cutbacks will necessarily be uneven in their impacts, producing extremely heavy reductions in demand for some materials and products and virtually no change in others. So long as this is the case, WPB must retain some allocation and scheduling controls and must maintain its contingent authority to minimize the consequences of acute shortages when they develop. To do this, WPB must maintain an effective organization, including a competent field staff, a compact group of industry divisions staffed by men with industrial know-how and continuing contact with business and labor through the operation of industry and labor advisory committees.

7. Maintenance of sufficient reporting of information to afford at all times a clear understanding of the industrial picture and to permit immediate and intelligent remedial action where indicated.

The Task Committee, in carrying out its responsibility, was instructed to eliminate rules, regulations and orders whenever and wherever feasible —on the theory that the fewer the restrictions the quicker would be reconversion and reemployment. However, in cases in which materials and components were certain to be in short supply, maintenance of conservation and allocation orders was prescribed.

# May Have Election on U. S. Property

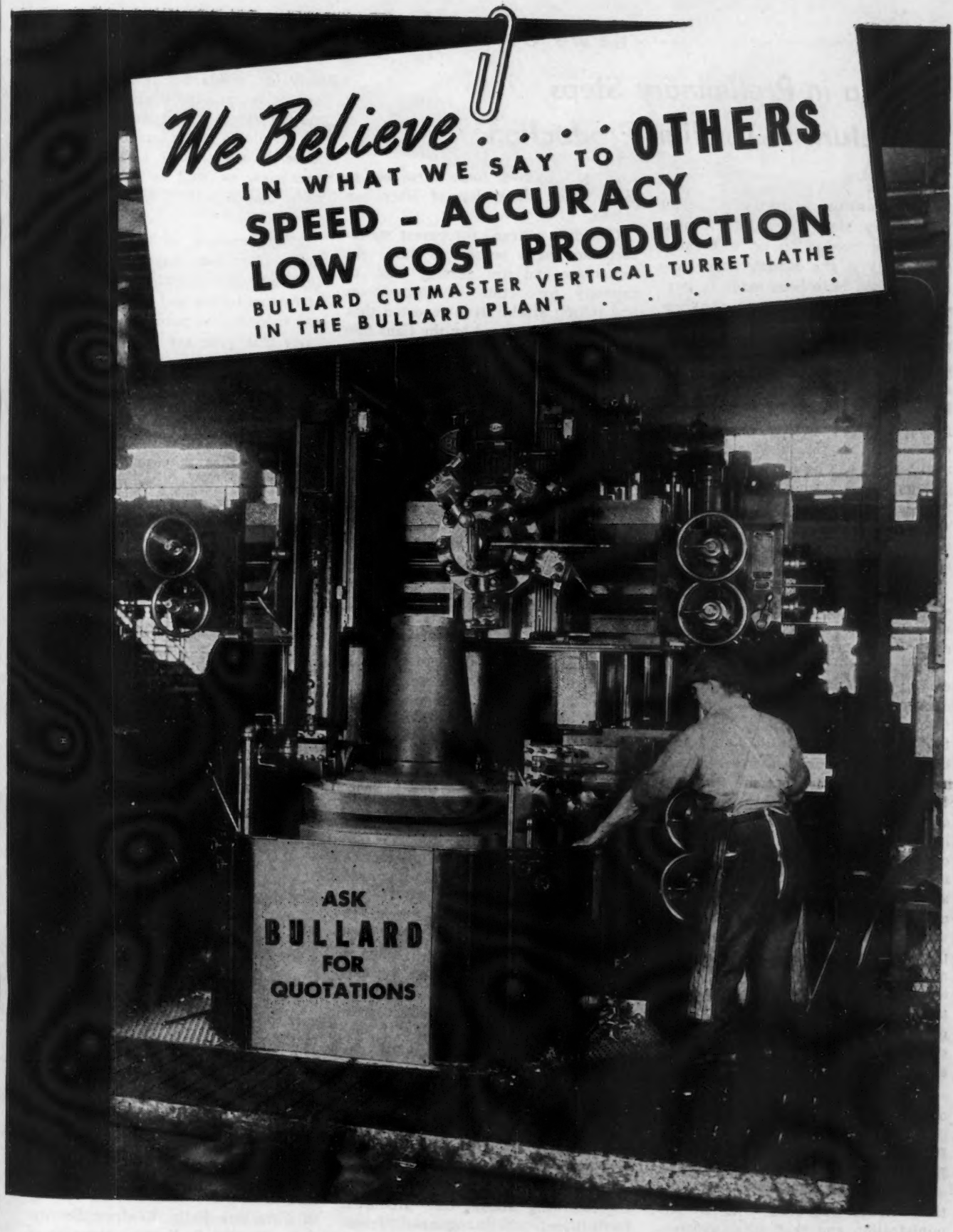
*Washington*

• • • **Giving the manufacturer** whose war contract has terminated opportunity either to buy government-owned equipment or to have it removed from his plant within 60 days after request for removal, except when necessary for other war purposes, Contract Settlement Director Robert H. Hinckley last week issued Regulation 4.

In many cases, the lease arrangements have required contractors to hold equipment in stand-by condition. The new regulation directs that, except when necessary for other war production or the national defense, these stand-by provisions will be waived.

Mr. Hinckley said it is important for manufacturers to know promptly what equipment they will be allowed to purchase and to know that unwanted equipment will not be left to crowd their plants. He pointed out that small plants as well as large ones, subcontractors as well as prime contractors, will have an opportunity to purchase equipment in their plants provided it is not needed somewhere else for war production. At the same time he urged manufacturers wherever possible to aid the government by providing temporary storage space in their plants for unwanted equipment. It was stated that after Germany's defeat and the termination of an increasing number of war contracts, the storage problem will be acute and cooperation in its solution was asked by all businesses.

The new regulation provides the methods by which the contractor will put in his bid for purchase of the equipment or will request its removal. It specifies the procedures the government agencies must follow to meet these requests when they are not inconsistent with the needs of war production or the national defense.




# THE BULLARD COMPANY

## BRIDGEPORT 2, CONNECTICUT, U.S.A.

## Canada in Preliminary Steps For Return to Civilian Production

***Toronto***

• • • Canadian industry is taking preliminary steps towards returning to civilian production on a broader scale early in the coming year. Announcements have been made in government circles in Ottawa that restrictions on the manufacture of a long list of consumer goods have been abolished and that industry may resume production as soon as Wartime Prices & Trade Board officials are prepared to release the necessary raw materials. So far, however, no announcement has been forthcoming regarding large supplies of materials for the production of consumer goods, although it is expected that action of this nature may be taken before the end of this year.

New order placing in the Canadian steel markets has become more pronounced, with civilian buying now exceeding war orders. A large part of the new war placements for steel are coming through government control departments and there has been some tightening in new orders placed on this account in the past few weeks. On the other hand heavy orders are pouring out from consumers that contemplate early return to peacetime operations and while mills are accepting this type of business, almost exclusively for 1945 delivery, they are unable to give any definite promise as to when actual shipment will be made. Exceptionally heavy orders for sheets, plates and bars have been reported from the agricultural implement industry which is going ahead with a substantially enlarged production program to meet domestic demand for farm machinery and at the same time is arranging to enter the export markets in a big way.

Announcement has been made that orders to the value of almost $5,000,000 have been placed with Cockshutt Plow Co. and Massey-Harris Ltd., Brantford, the first order for farm equipment placed by the United Nations Relief and Rehabilitation Administration and that other substantial orders are in prospect. Roy F. Hendrickson, Deputy Director General of UNRRA said that much of the equipment would be sent to Norway and Denmark when liberation comes and to France if the Military think such material is necessary. Greece and almost every occupied country of Europe will receive some farm equipment when their day of liberation comes.

Canadian railroad equipment manufacturers have ceased to turn out munitions and are getting back to capacity production of locomotives and rolling stock. It is reported that orders already placed by the Canadian Pacific and Canadian National Railways for delivery in 1945 total upwards of 6000 cars. According to a report from Ottawa, a number of new refrigerator cars soon will roll out of Canadian railway shops and some big mountain-type locomotives are being built. A brisk demand for railroad equipment has developed, not only in Canada but in all countries, and it is expected a sizeable export market for cars and locomotives will be available to Canadian builders after the war. Some Latin American countries, as well as India, already have placed rolling stock orders in Canada.

Manufacturers of other types of goods, however, have not been so fortunate with regard to the supply of raw materials and many that planned to return to peacetime operations early this year are still waiting for deliveries of necessary steel. It is stated that a number of companies which have completed war contracts and with no additional war business forthcoming, have received some assurance that they will be able to swing back into peacetime channels without much further delay.

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## Canada's Steel Output Below Capacity

***Toronto***

• • • Production of both iron and steel in Canada continues to run well below rated capacity. According to figures supplied by The Dominion Bureau of Statistics, pig iron output in August dropped to 65.59 per cent with eight of the 14 blast furnaces blowing, leaving six idle. Steel production, however, showed a minor gain in the month rising to 82.4 per cent of rated capacity.

During August pig iron production totaled 151,452 net tons, compared with 166,004 tons in July and 164,906 tons in August 1943. In the month under review output included 123,068 tons of basic iron, 18,034 tons of foundry iron and 10,350 tons of malleable iron.

In the eight months ending with August pig iron output totaled 1,266,979 tons compared with 1,184,064 tons in the same period of 1943 and 1,308,731 tons in the 1942 period.

Output of ferroalloys in August amounted to 18,808 net tons compared with 14,508 tons in the previous month, and 18,429 tons in August a year ago. In the month under review the following alloys were produced: ferrosilicon, silicomanganese, ferromanganese, ferrochrome, chrome-x and ferrophosphorous. For the first eight months of this year cumulative production of ferroalloys totaled 124,554 net tons against 151,630 tons in the same period of last year, and 140,522 tons in 1942.

Production of steel ingots and castings during August totaled 246,755 tons, compared with 234,418 tons in July and 246,820 tons in August a year ago. Output in the month under review included 235,556 tons of steel ingots, and 11,119 tons of castings. For the eight months ending with August, production of steel ingots and castings totaled 1,993,756 tons, against 1,996,481 tons in the same period of 1943 and 1,064,666 tons in the 1942 period.

o o o

## Canadian Firm Plans Magnesium Refining

• • • Mid-Canada Magnesium Mines, Ltd., with the sole Canadian right to use the Keemle Electrothermic Process for the production of metallic magnesium, plans to construct and put in operation as soon as possible the first unit of a plant to produce 1500 lb. of refined metal daily. Estimated cost of the unit is about $100,000.

The dolomite deposits, from which mid-Canada proposes to extract the magnesium, are located in the vicinity of Foresters Falls, Renfrew County, Ont. Samuel R. Keemle, inventor of the process, a metallurgist and consulting engineer, will supervise the installation of the plant.

This process, it is claimed, will produce magnesium metal at a cost of about 10c. per pound, compared with the current market price of 25c.

*2¾% Nickel Steel locomotive rods, one bent cold to show ductility.*

**QUENCHED AND TEMPERED**

# NICKEL STEEL

**FORGINGS COMBINE**

# EXCEPTIONAL DUCTILITY WITH HIGH TENSILE STRENGTH

**Composition and Typical Properties of Normalized Quenched and Tempered 2¾% Nickel Steel Rods**

| Description or Size | Melt Yield Pt. No. #s per Sq. In. | Tensile Strength #s per Sq. In. | Elong. % in 2 In. | Reduction in Area % | ANALYSIS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Car. | Mang. | Phos. | Sul. | Sil. | Ni |
| Main Rod.... | 92900 | 110000 | 25.0 | 64.4 | .31 | .78 | .027 | .026 | .25 | 2.75 |
| Main Rod.... | 86500 | 104500 | 25.5 | 65.6 | .32 | .86 | .034 | .032 | .29 | 2.69 |
| Main Rod.... | 86360 | 104400 | 26.0 | 64.8 | .32 | .86 | .034 | .032 | .29 | 2.69 |
| Main Rod.... | 87850 | 102350 | 26.0 | 66.2 | .31 | .89 | .037 | .025 | .32 | 2.69 |
| Front Rod.... | 86000 | 102250 | 25.0 | 67.3 | .29 | .82 | .035 | .027 | .24 | 2.71 |
| Front Rod.... | 83900 | 104250 | 25.0 | 66.1 | .29 | .82 | .035 | .027 | .24 | 2.71 |
| Front Rod.... | 86850 | 104250 | 27.0 | 66.1 | .32 | .86 | .035 | .025 | .30 | 2.65 |
| Front Rod.... | 89500 | 107050 | 25.5 | 65.6 | .32 | .86 | .035 | .025 | .30 | 2.65 |
| Back Rod.... | 89500 | 107650 | 25.0 | 62.7 | .30 | .79 | .030 | .025 | .22 | 2.71 |
| Back Rod.... | 87500 | 106450 | 25.0 | 65.4 | .29 | .82 | .035 | .027 | .24 | 2.71 |
| Back Rod.... | 87000 | 105600 | 25.0 | 65.4 | .29 | .82 | .035 | .027 | .24 | 2.71 |
| Back Rod.... | 88150 | 104850 | 26.0 | 66.8 | .29 | .82 | .035 | .027 | .24 | 2.71 |

*Specimens Taken from Mid-Section of Prolongations of the Forgings*

The above table compiled by the American Locomotive Company shows the chemical compositions and mechanical properties of some normalized, quenched and tempered nickel steel front, main and back rods recently produced as replacement rods for locomotives being speeded up and rebalanced. These values are typical of replacement rod forgings recently tested by that company.

Quenched and tempered nickel steel forgings of this type provide high tensile strength and ductility, combined with unusual toughness and high fatigue strength—qualities which tend to obviate breakage when employed as rods in railroad service.

A booklet entitled, "NICKEL ALLOYS IN RAILWAY EQUIPMENT," describes important and varied uses of nickel steels and other alloys of nickel. Send for your copy today.

★ Nickel ★

**THE INTERNATIONAL NICKEL COMPANY, INC.,** *67 Wall St., New York 5, N. Y.*

# Civilian Output Resumed Under "Spot" Plan by Eight Manufacturers

***Cleveland***

• • • **The Cleveland district** office of the WPB has received 183 applications under the "spot" authorization plan which is intended to increase the volume of civilian production and prepare the way for full reconversion to peacetime production. George A. Moore, WPB manager, said that manufacturers are being encouraged to file these applications so that maximum production and employment may be maintained. The applicants who have already filed include manufacturers located in Cleveland, Sandusky, Mansfield, New Washington, Monroeville, Ashtabula, Garfield Heights, Tiffin, and Bedford.

Of the applications filed, none have been denied but 56 have been rejected for insufficient information or because they sought to make civilian articles that are not yet permitted. Eight authorizations have been issued, all to Cleveland companies. H. Goodman, Inc., has been issued two authorizations, one to make spring mattresses and the other for baby crib springs. United Vacuum Cleaner Stores, Inc., normally a service outfit, will make vacuum cleaners. Jumbo Heater & Mfg. Co., has been authorized to assemble about 600 hot water heaters a month, the parts for which will be obtained from manufacturers.

Kromex Corp., which has been engaged in making grenade launchers for the Army, will make aluminum kitchen utensils. This company reported that completion of the Army contract would mean complete discharge of its personnel, about 43 workers, by November. Cleveland Garment Hanger Co., will manufacture coat hangers; Cuyahoga Spring Co., will make automobile running board clips; and Ballanoff Metal Products Co., has been authorized to make heat resister pads for kitchen use.

Under the "spot" procedure, civilian production may be resumed or increased if manpower, materials, and facilities are available and are not otherwise usable for war production.

Some 10,800 tons of carbon steel and 2700 tons of alloy steel are on hand for distribution to manufacturers in the Cleveland WPB district during the fourth quarter. The allotment is part of the materials bank set up under the "spot" authorization plan. It is possible, according to Frank M. Aldridge, deputy regional WPB director, that further allocations of steel may be available later in the fourth quarter. The current allotment is intended for immediate use and will be distributed promptly and widely to manufacturers who apply and qualify under the "spot" reconversion procedure. Up to this time, the only steel available has been from idle and excess stocks.

Serious consideration is being given in this area to the "spot" plan by the WPB, and the major complaint at present is the inability to get clearance from the War Manpower Commission. However, the actual handling of the applications from manufacturers will be speeded up by WPB, and there are indications that action by the War Manpower Commission will tend toward leniency and speed.

The questions on the applications, in some instances, have caused hesitation among manufacturers who might otherwise file application to reconvert to civilian production. For example, one question dealing with manpower asks how many employees will be released if the application is denied. Manufacturers fear that if such questions are answered, even though the employees might be needed now, the War Manpower Commission may step in and compel their release to manufacturers where shortages in help are hindering war production.

## COMING EVENTS

Oct. 5-7—SAE National aircraft engineering & production meeting, Los Angeles.
Oct. 5-7—National Electronics Conference, Chicago.
Oct. 5-6—AIME Electric furnace steel conference, Pittsburgh.
Oct. 10-11—Gray Iron Founders' Society, Inc., Cincinnati.
Oct. 12-14—The Electrochemical Society, Inc., Buffalo.
Oct. 12-14—American Society of Tool Engineers, semi-annual meeting, Syracuse, N. Y.
Oct. 16-20—National Metal Congress, Cleveland.
American Society for Metals.
American Welding Society.
Society for Experimental Stress Analysis.
American Institute of Mining & Metallurgical Engineers, Iron and Steel Division and Institute of Metals Division.
American Industrial Radium and X-Ray Society.
Oct. 31-Nov. 1-2—American Institute of Steel Construction, annual meeting, Atlantic City, N. J.
Nov. 2-3—Industrial Management Society, National Time and Motion Study Clinic, Chicago.
Nov. 27-Dec. 2—National Exposition of Power and Mechanical Engineering, New York.
Dec. 4-6—SAE National air cargo meeting, Chicago.

# 20,000-Ton Troopships On Navy Rush List For Future Invasions

***Kearny, N. J.***

• • • **All 20,000-ton troopships** needed for future invasions, have been put on the Navy's must-rush list, according to an announcement recently by Lynn H. Korndorff, president of U. S. Steel's Federal shipyard here, builder of these 600-ft. vessels.

The speed-up demanded builds for peace as well as for war, Mr. Korndorff pointed out.

"Originally of Maritime Commission design," he said, "the vessels which are now becoming troopships were part of the commission's long range policy for rebuilding a strong merchant marine for America. The idea was to provide, in addition to the three C-type cargo carriers, medium size passenger liners having considerable speed, though not attempting to set the pace of such super-liners as the Queen Mary.

"The design made a desirable troopship, outclassing the assorted vessels which were pressed into service to move our forces during the last war.

"It now seems possible that vessels of this class may make up an important part of American flag passenger service after the war. At least, many believe that part of the ocean-traveling public will prefer the more congenial comforts of small liners; while, of course, some who are in a hurry will be more likely to travel by air."

# "Put it on the Blanchard"

## ...GET THESE ADVANTAGES

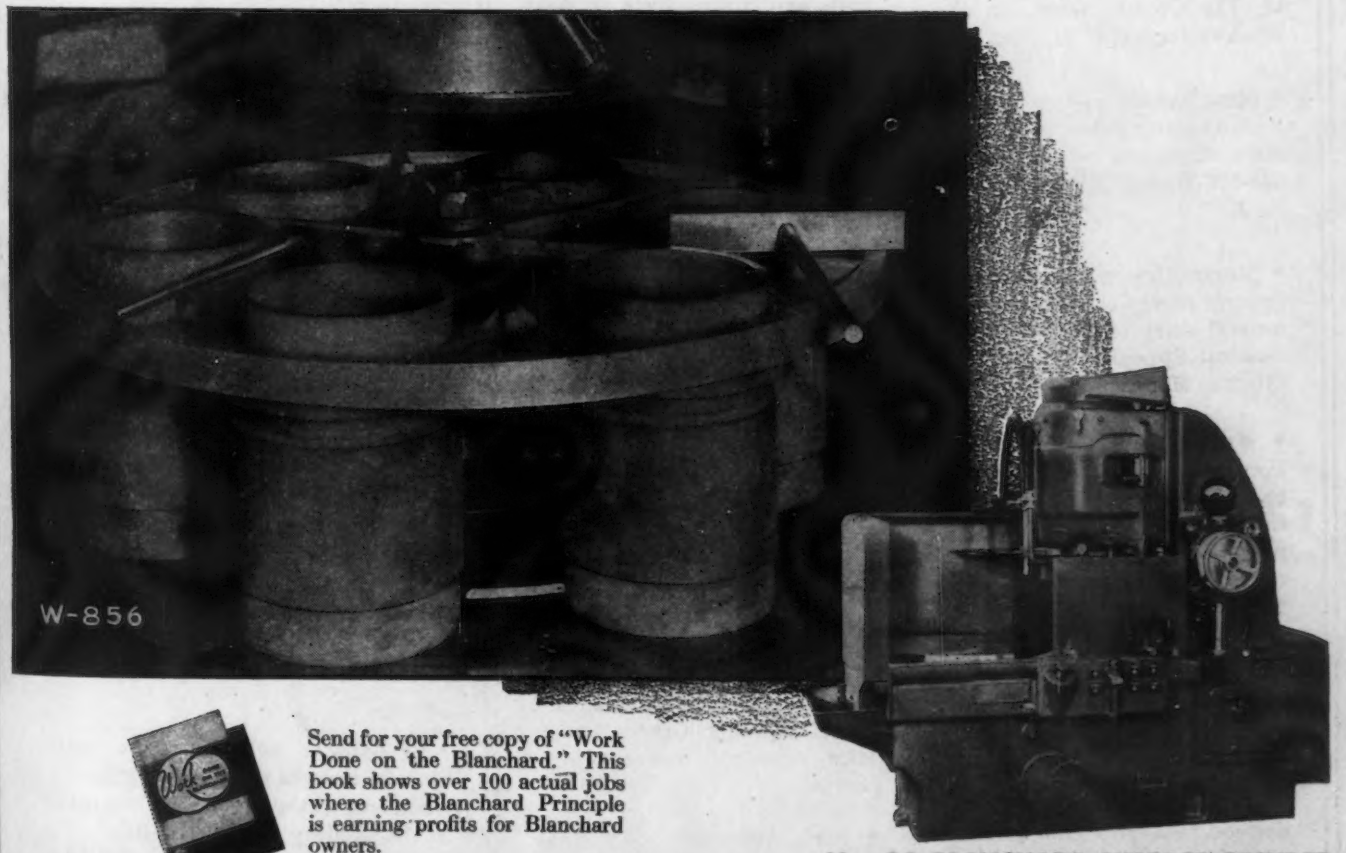
**Production ✓**
**Adaptability ✓**
**Fixture Saving**
**Operation Saving**
**Material Saving**
**Fine Finish**
**Flatness**
**Close Limits**

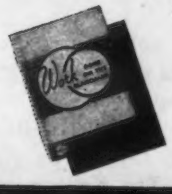
## Grinding Cylinder Barrels

These 7½" diameter cylinder barrels are held on the chuck of a No. 18 Blanchard Surface Grinder and supported in a fixture.

The material is nitroloy steel and $^{7}/_{16}$" of stock is removed to limits of .25". Twelve cylinders, 24 surfaces, are ground per hour.

This job shows the ability of the Blanchard Grinder to remove, rapidly and economically, large amounts of hard metal.



Send for your free copy of "Work Done on the Blanchard." This book shows over 100 actual jobs where the Blanchard Principle is earning profits for Blanchard owners.

**No. 18 BLANCHARD SURFACE GRINDER**

BLANCHARD

The BLANCHARD MACHINE COMPANY
64 STATE STREET, CAMBRIDGE 39, MASS., U. S. A.

# Industrial Briefs . . .

• REMOVING OFFICE — Mobile Engineering Co. has announced the removal of their office and factory to 1308 Elston Avenue, Chicago.

• PLANT ADDITION—Logan Engineering Co., Chicago, has constructed a small addition to its plant to provide additional manufacturing facilities.

• FORMS ORGANIZATION—Irving Schwartz, for the past 20 years connected with Scully Machinery & Equipment Corp., has formed an organization to handle used or reconditioned foundry and industrial equipment, located at 327 South La Salle Street, Chicago.

• DISTRIBUTOR NAMED — Miami Valley Distributing Co., Dayton, Ohio, has been made distributor of The Crosely Corp., in the southwestern part of Ohio.

• NEW LOCATION—Supreme Laboratory has moved its main offices and laboratories to 578-582 Market Street, Newark, N. J.

• MOVES OFFICE — Wickwire Spencer Steel Co. has moved the general sales office of the Mechanical Specialties Division to Clinton, Mass.

• WINS AWARD—American Society of Mechanical Engineers has been honored with the Distinguished Service Award of the Ordnance Department, in recognition of scientific and engineering achievement.

• AWARDED CONTRACT—Australian Iron & Steel, Ltd., has awarded a contract to the Wilputte Coke Oven Corp., New York, for the engineering work on a battery of 48 Wilputte underjet, high and low burner ovens, including by-product equipment.

• ORGANIZES DIVISION — Bowser, Inc., Detroit, has organized a Special Products Division for postwar business development work. J. S. Allen will direct the sales of the division.

• NEW LABORATORY — National Battery Co. plans to construct and equip a new testing laboratory for its Gould Commercial Division plant at Depew, N. Y.

• POSTWAR PLANS — American Can Co. will construct a new manufacturing plant on a 49-acre site in St. Paul, Minn., soon after the war.

• BUYS EQUIPMENT—Ergolyte Mfg. Co., Philadelphia, has purchased the equipment and inventory of the Precision Engineering Co., Chicago.

• FIRST PRIZE — Demco Tool Service, Inc., Glendale, Cal., has received first prize for machine tools and cutting tools at West Coast exposition.

• WILL REPRESENT — Betz-Pierce Co., Cleveland, has been appointed exclusive representative and distributor of tools for Delloy Metals in northern Ohio and western Pennsylvania.

• NEW COMPANY — Donham Craft, Inc., Thomaston, Conn., has been formed and is dedicated to advancing the art of gold plating to an exact science.

• PURCHASED PLANT — Continental Can Co. has purchased Cameron Can Machinery Co., Chicago, which will be operated as a subsidiary. Officers of Cameron will be retained.

• OPENS BRANCH—E. L. Essley Machinery Co., Chicago, has opened a branch office at 607 Keeler Building, Grand Rapids, Mich. Harry J. Swanson is in charge.

• BUYS PROPERTY — Allegheny Ludlum Steel Corp. has purchased property in St. Louis from the National Refining Co. The property is being used as a district office as well as a warehouse.

## *Organization Meeting Held by Lubrication Engineers' Society*

***Pittsburgh***

• • • **The organizational meeting,** attended by about 60 prospective members, of the American Society of Lubrication Engineers was held Sept. 27 in Pittsburgh. This society, formed under a State of Illinois charter on March 3, 1944, is a non-profit organization that will endeavor to encourage the active cooperation of industry and the professions in the advancement and application of the art of lubrication and to support and stimulate the study and development of the theory and practice of the art. It is also intended that the society will sponsor, carry on and provide facilities for research in lubrication and in the fields of physics, chemistry, mechanics and other sciences and arts related to the subject.

The newly founded organization has aroused the interest of both industry and engineering schools. Representatives from various steel companies, railroads, aluminum producing and fabricating companies, and other manufacturers, as well as the department heads of the engineering schools of some five or six colleges were present.

While many other technical associations deal with lubrication horizontally in their activities, there has been no vertical organization for lubricating and lubricating research engineers. There was an organization in existence some 20 years ago known as the American Society of Lubricating Engineers, but its charter was revoked when the society disbanded. The newly formed society has been granted a new charter, and is in no manner connected with the former group.

## Report Pullman-Standard Makes Offer to Buy Company

*Chicago*

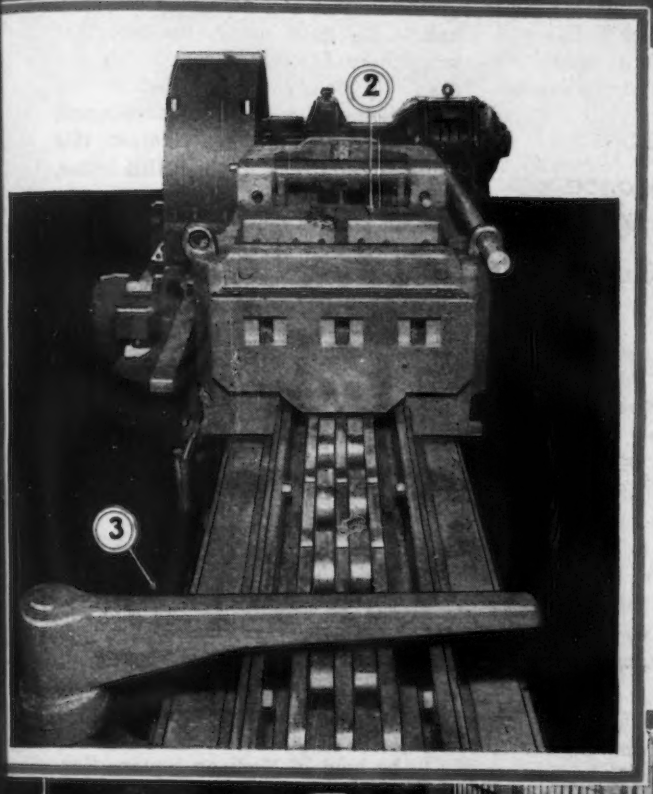
• • • **Reports published here state** that Pullman-Standard Car Mfg. Co. has made tentative offers to purchase M. W. Kellogg Co., $25 million New York industrial engineering and contracting firm. The Kellogg company manufactures welded and special steel products, oil stills, tanks, and receptacles for the oil, chemical, paper and similar industries. Refinery and power plant installations also are a specialty.

# McKAY

## BAR DRAWBENCHES

(WITH OR WITHOUT)

PUSH POINTERS




1. Hydraulic push pointer. (Insures lower maintenance cost)
2. Automatic wedge type grip-buggy for single and multiple draw with quick change feature.
3. Hydraulic or pneumatic throw-off arm.
4. Hi-speed automatic grip-return with slow pull-in feature.
5. Steel construction throughout.
6. Constant or variable speed drive.

## THE McKAY MACHINE CO.

Engineers and Manufacturers of

SHEET, TIN AND STRIP MILL EQUIPMENT

YOUNGSTOWN, OHIO

Patents Pending

*also build:* TUBE DRAWBENCHES, BAR SHEARS and ROTARY POINTERS

## See 379,000 Tons of Copper Quarterly When Germany Is Defeated

***Washington***

• • • WPB recently said that refined copper requirements should be approximately 379,000 tons a quarter after Germany is defeated. Military and essential civilian users should consume 281,000 tons and civilian users 98,000 tons, government officials indicated.

Wire mill production should increase after the defeat of Germany, although a drop in brass mill production is expected. Unless projected requirements for copper wire and cable are materially altered, the reduced military demands after X-Day will permit copper wire and cable mill facilities to accept and deliver orders for civilian use in a pattern and of a copper content approaching prewar levels.

Removal of all restrictions on deliveries to and from warehouses of copper wire mill products after X-Day is contemplated, WPB said.

Industry members have recommended that allocation of refined copper and directed production and distribution of intermediate shapes should be continued until all hostilities cease. The basis for this recommendation was the possibility that the supply of copper after X-Day will be less than the amount needed to take care of military and civilian requirements.

## Improper Acceptance Of Japanese Orders Denied by Companies

***Cleveland***

• • • Charges that various firms, including Thompson Products Co., Cleveland, and Ohio Seamless Tube Co., Shelby, Ohio, were agreeing to accept Japanese orders without reservation, but subject to cancellation in the event of a U. S. embargo, and in other ways attempting to set up trade relations with the Japanese, were emphatically denied by both of these firms. The statements were made before a Senate investigating committee.

In a letter of protest, W. C. Connelly, president of the Ohio Seamless Tube Co., stated the company's last shipment, in March 1939, to Japan, the Secretary of State was recognizing the Japanese government which had an ambassador in Washington and the United States had an ambassador in Japan.

He continued, "inasmuch as the greatest asset any person or company has is its good name, we feel that with these facts you can do no less than personally appear before the U. S. Senate Committee before whom you made the charges against this company and read to them this letter, which we ask you to place in the records of that Senate committee and in the records of your office pertaining to this subject." The letter was addressed to James S. Martin, chief of the economic warfare section of the Department of Justice, who had made the charges. Thompson Products expressed surprise at the charges, denying them completely.

## Aid to Reconversion Topic at Power Show

***New York***

• • • Circumstances developing with unexpected force have increased interest in plans of exhibitors at the 16th National Exposition of Power and Mechanical Engineering, which is to be held in Madison Square Garden, New York, Nov. 27 to Dec. 2.

One of the most important purposes of the exposition will be its assistance in forming judgments as to the probable availability and uses of various manufacturing materials in months to come.

A preliminary review of products that will be on display indicates that the following classifications will be well represented: heat and power production, distribution of energy, control appliances, auxiliary apparatus, instruments for indicating and recording measurements of quantities and pressures, power transmissions, material handling equipment, engineering materials, engineering specialties, machines and tools.

One of the newest design features at the exposition will be an air-cooled worm gear speed reduction unit, which is said to have a much greater load-carrying capacity than the exhibitor's standard worm gear unit of equal size, and consequently costs materially less per dollar of horsepower transmitted.

The show is under the management of the International Exposition Co., of which Charles F. Roth, manager of the show, is president.

**TAIL TURRET:** *The tail turret of this B-29 Superfortress packs a "wallop" instead of a "sting." Its two .50 cal. machine guns flank an ominous-looking 20 mm. cannon which hurls explosive shells more than ¾ of an inch diameter.*

# BONDED

*with* Chicago FV

*the Pedigreed Bond*

It's the new bond that gives the ultra smooth finishes you get with Chicago Grinding Wheels—

Precision finishes undreamed of before—

Finishes so accurate that you can measure them in micro inches with a Surface Analyzer.

## PERFECT FINISH INSURANCE

**Whatever you have to finish—metals, alloys, plastics, wood, laminates or composition materials—you can do it better with Chicago Wheels.**

**Chicago Wheels have kept pace with the precision requirements of our war industries, and you can use them with confidence to finish civilian goods better in double quick time.**

### CHICAGO GRINDING WHEELS

**A wide range of grains and grades and—for the duration—sizes up to 3" in diameter.**

### CHICAGO MOUNTED WHEELS

**The first made and the finest today. In a selection of bonds, abrasives and shapes to handle each job more efficiently.**

### *TRY ONE FREE*

**We'll send without charge a Mounted Wheel or an FV Bond Grinding Wheel. Tell us size you'd like.**

***Write for Catalog listing all Chicago products and showing comparative photographs of finishes with different kinds of Wheels.***

ARMY E NAVY

MOUNTED WHEELS

SMALL GRINDING WHEELS

**CHICAGO WHEEL & MFG. CO.**

*Headquarters for Mounted Wheels and Small Grinding Wheels*

**1101 W. Monroe St., Dept. RA, Chicago 7, Ill.**

*Half a Century of Specialization has established our Reputation as the Small Wheel People of the Abrasive Industry.

Send Catalog. Interested in RA-10

☐ Mounted Wheels. ☐ Grinding Wheels.

☐ Send Test Wheel. Size.....

Name.....

Address.....

# Contracts Terminated After V-Day Will Be Settled Promptly

*Washington*

• • • **Lieut. Gen. Brehon Somervell,** Commanding General of the Army Service Forces, in announcing recently that the Army had terminated 27,344 war contracts up to Aug. 1, and had settled 22,743, said that contractors may feel assured that all contracts terminated after V-day will be settled promptly.

Of the 4600 terminated contracts that remained unsettled on July 31, the announcement said, more than 3500 had been held up because contractors had not filed their claims.

Contrasted with the $3,500,000,000 in contracts terminated 26 years ago, the War Department said that in the first seven months of 1944 it has been obliged to terminate contracts with an uncompleted value of $4,743,000,000. During this same seven months, settlements made with war contractors covered contracts with a total face value of $4,362,000,000. This was substantially more than the value of all war contracts cancelled following the World War.

Up to Aug. 7, there were $7,140,000,000 in contracts terminated but still unsettled. At the settlement rate achieved in July, 1944, when the contracts with an uncompleted value of $1,253,000,000 were disposed of, this backlog of unsettled contracts would be disposed of in less than six months, it was stated.

## U. S. Company Opens Free Technical Course For Latin Americans

• • • **Latin American industrialists** are to be offered an opportunity to provide groups of employees of their own choosing with technical and practical instruction in precision industrial instrumentation in this country, it has been made known by E. B. Evleth, vice-president and general manager of Brown Instrument Co., a division of Minneapolis-Honeywell Regulator Co. Instruction will be conducted at the Brown School of Instrumentation in Philadelphia.

The school has no tuition fee. The expenses of the students while studying are paid by the companies which send them to Philadelphia for instruction.

Mr. Evleth described the plan as an honest approach to good-will between Latin American republics and the United States, which will not only promote industrial progress in South America, but will also encourage interest in American commodities by the Latin American nationals.

"South America," said Mr. Evleth, "is already improving its industrial status and is bound to show further progress with or without our help. On the admissions of its own representatives and the Latin American industrial press, South American business is in real need of technical knowledge. Without that knowledge it cannot compete in world markets. There is no good reason why industrialists of the United States should not encourage our friendly neighbors to the south to establish themselves more firmly on an industrial basis."

## Subject of ILO Monograph; Safe Use of Grinding Wheels

*Montreal*

• • • **Both American** and European practices are covered in the monograph just published by the International Labour Office, Montreal, under the title, "The Safe Installation and Use of Abrasive Wheels." Particularly in the chapter on precautions against bursting of wheels there are a number of pictures of wheel guards and other design features of European origin unfamiliar to the American engineer.

The 178-page booklet, which is largely the work of G. Stevenson Taylor, deputy chief inspector of factories, London, is divided into two parts. Aside from the chapter mentioned, Part I has chapters covering the composition and manufacture of abrasive wheels, general precautions against accidents and prevention of dust inhalation. Part II comprises in full the safety regulations setup in Germany, Great Britain and the United States relating to grinding wheels.

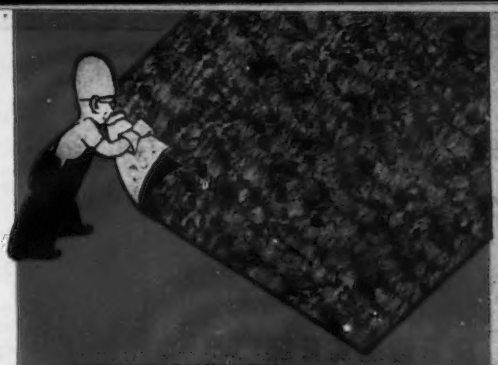
In the appendix, the mathematical researches on the strength of abrasive wheels by Dr. Vitaliano Colombo, director of the Italian Association for the Prevention of Accidents, is summarized. A paper on "Stresses in Rotating Disks," based on photoelastic studies by Thos. H. Frost and K. F. Whitcomb of the Norton Co., is also included.

The monograph may be obtained from the Washington branch of the International Labour Office, 734 Jackson Place, for $1.

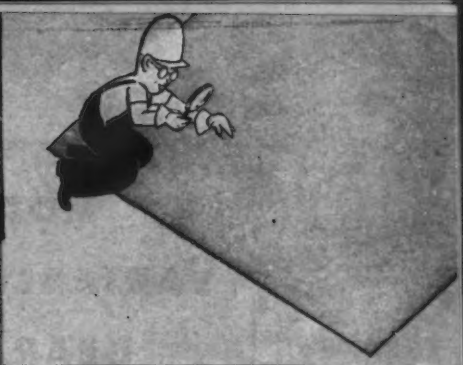
**NEW BRITISH TANK:** *"The AVRE," Armored Vehicle Royal Engineers is the latest mortar tank being used in action against the Germans in Europe. Similar in design to the Churchill tank, it carries a special mortar mounted in the turret and can lay flexible tracks across marshy ground or form causeways across ditches and streams.*

# Say Good-Bye

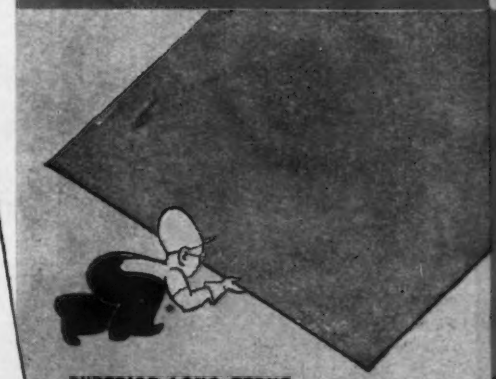
## TO JACK-OF-ALL-TRADES *Steel Sheets*



**SUPERIOR GALVANIZED**
A bright-spangled, commercial galvanized sheet with exceptionally good working qualities. Soft and uniform.

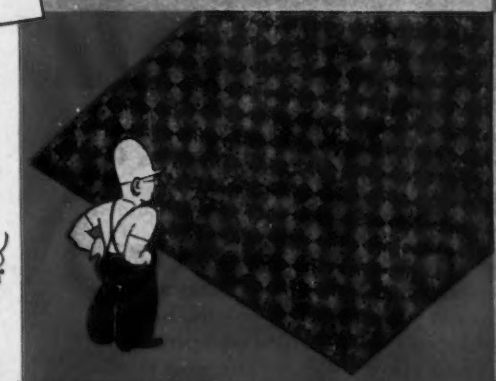


**SUPERIOR GALVANNEALED**
A special quality steel sheet that takes and holds fine finishes. Rust resistant. Easily fabricated, easily soldered.

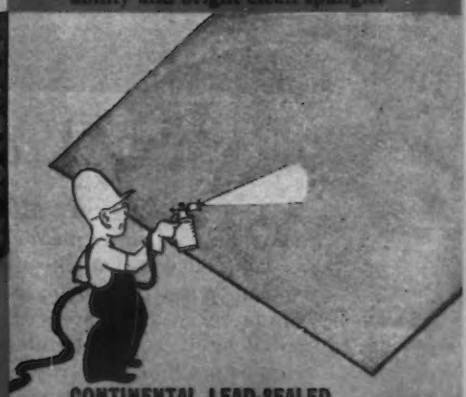


**SUPERIOR LONG TERNE**
A favorite with manufacturers. Open hearth steel base, tempered for accurate forming. Takes paint, resists rust.

**SUPERIOR COPPER STEEL**
Copper steel base gives greater resistance to corrosion. A fine sheet for workability and bright clean spangle.



**SUPERIOR CHECKERCOAT**
Galvanized by the Superior process with bright, checkered spangles. Pleasing to look at, fine to work with.



**CONTINENTAL LEAD-SEALED**
New lead-alloy coated sheet "takes" and "holds" paint. Solders readily. Fine for die forming. Soft and ductile.

IN men and materials, this is the day of the specialist. There's no place for *jack-of-all-trades* steel sheets. That's why nearly every Continental and Superior sheet is a specialty . . . its properties designed for a definite class of duty. One manufacturer may require softness and workability in a steel sheet, another stiffness and corrosion resistance, still another, the ability to "take" and "hold" paint and other finishes.

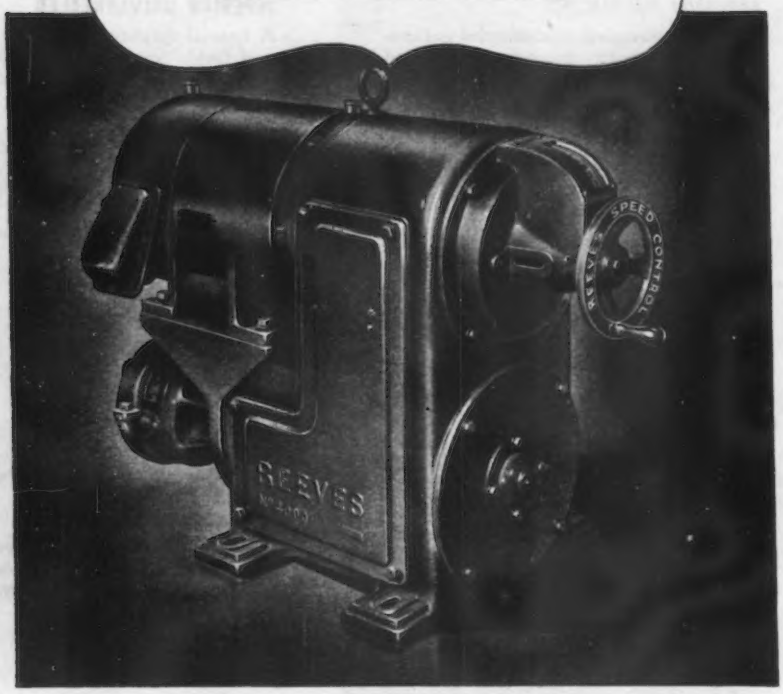
Continental Steel Corporation and its subsidiary, The Superior Sheet Steel Company, produce steel sheets in more than thirty different kinds of surface treatments, finishes, and coatings in a wide range of specifications. Call on Continental or Superior for steel sheets to fit your needs.

**CONTINENTAL STEEL CORPORATION • KOKOMO, INDIANA**
**THE SUPERIOR SHEET STEEL COMPANY • CANTON, OHIO**

# CONTINENTAL
## STEEL CORPORATION

**PRODUCERS OF—** SHEETS: Black, Galvanized, Copperior, Hot and Cold Rolled, Special Coated, Long Terne, etc.
WIRE: Bright Basic, Annealed, KONIK, Coppered, Tinned, Special Manufacturer's, etc.
Nails, Staples, All styles of fence, Gates, Steel Roofing, other steel products.

MOTOR *plus*
VARIABLE SPEED *plus*
GEAR REDUCER

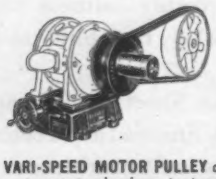



ALL IN 1 COMPACT UNIT

★ This is the REEVES Motodrive. It is a complete, streamlined variable speed power plant consisting of constant speed motor—any standard make—variable speed mechanism, and gear reducer. Installed on any production machine, it provides highly efficient driving power at variable speeds—not just a few step-speeds, but any speed between predetermined limits. This enables an operator to run his machine at *exactly* the best speed for every changing condition; increased production from 25 to 50 per cent is not unusual—in many cases output is doubled . . . The Motodrive is one unit in a complete line built by REEVES. So important are these variable speed units to production processes that they are standardly furnished on 1839 different makes of machines. Thousands more installed *annually* on machines in service. Send for booklet 1-423.

REEVES PULLEY COMPANY • COLUMBUS, INDIANA
*Recognized Leader in the Specialized Field of Speed Control Engineering*

VARIABLE SPEED TRANSMISSION for providing infinite, accurate speed flexibility over wide range.



VARI-SPEED MOTOR PULLEY converts any standard constant speed motor to a variable speed drive.

MOTODRIVE combines motor, speed varying mechanism and reduction gears in single unit.

*Accurate Variable*
REEVES
SPEED CONTROL




## *Electrochemists Will Commemorate Fiftieth Anniversary of Group*

*New York*

• • • Electrochemists will hold their 86th convention at Niagara - Buffalo from Oct. 12 to 14, 1944, in recognition of the 50th anniversary of the North American Electrochemical Industry.

Dr. William Blum

The convention program includes a session on "Caustic and Chlorine," "Electric Induction Heating," "Dry Batteries," and "Electroplating."

One main event of the convention will be the bestowal of the Acheson Gold Medal and one thousand dollar prize on Dr. William Blum of the National Bureau of Standards in recognition of his outstanding services in the standardization of the electroplating art. Sidney D. Kirkpatrick, editor of "Chemical & Metallurgical Engineering," and president of the Electrochemical Society, will make the formal presentation.

Past recipients of the Acheson award are: Edward G. Acheson (graphite and carborundum); Edwin F. Northrup (induction furnaces); Colin G. Fink (tungsten, chromium, tin); Frank J. Tone (silicon and silicon carbide); Frederick M. Becket (ferroalloys); Francis C. Frary (aluminum); and Charles F. Burgess (electrolytic iron, dry batteries).

## Spot Authorization Procedure

*Washington*

• • • The spot authorization procedure is undergoing review by regional WMC and WPB officials for the purpose of streamlining it and getting a closer understanding between the two agencies, WPB Chairman J. A. Krug said recently.

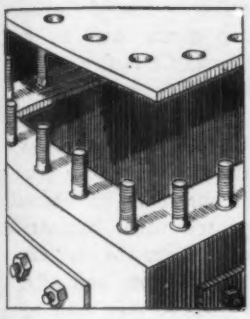
At the same time, Mr. Krug answered manufacturers in the Buffalo area who had reported to the Bureau of Labor Statistics that they do not expect "well-tailored" cutbacks which will permit the most efficient reconversion from the standpoint of production costs.

**SEE THIS "GUN" AT THE NATIONAL METAL CONGRESS** CLEVELAND, OHIO OCTOBER 16-20

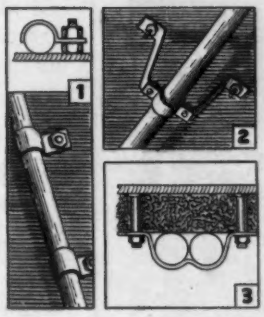
# NELSON *Electric Arc* STUD WELDERS

*—end-weld studs in less than one-half second!*

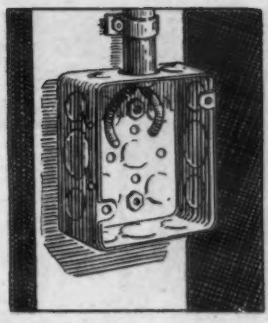
## SOME WAYS 460 INDUSTRIAL PLANTS AND SHIPYARDS ARE USING IT!



**Inspection covers** of all types can be secured with Nelson Studs. No drilling holes through casings, or hand welding studs. Studs are automatically welded in less than ½ second. No leaking, no loosening! The weld is stronger than the stud.

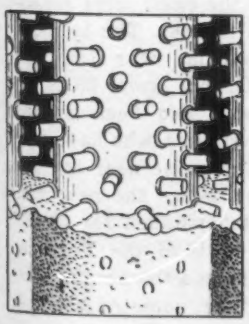



**Wiring, conduit, and pipe** are quickly secured. Here illustrated are a few of many methods: 1. Securing conduit. 2. Securing pipe (single or multiple runs). 3. Securing wiring of all kinds over soft insulation materials.



**Electrical equipment** of all kinds, outlet boxes, circuit breakers, etc., can be secured without drilling metal beams or welding small pads. Accurate locating is easy because all Nelson Studs are pointed. The economical way to secure small parts.

**Metal Lath Studs** are welded and the insulation impaled or sprayed on over them. Slotted washers secure the insulation. The metal lath is laid and secured by bending over the stud head. It lies flat so it is easily covered with the plaster.



**Studding boiler tubes** increases their efficiency. Studs act as reinforcement for the ceramic material which is put on to conduct heat to the tubes. The stud also conducts heat into tube. Nelson Studs save time and material.

**The Nelson Stud Welder** is completely portable and light in weight. Proven by five years of actual use and used by more than 460 industrial plants it can be employed wherever there is need to end-weld studs to metal. Excellent for repair and maintenance work of all kinds. *Write to the address below for complete details and catalog.*

Cutaway view shows complete fusion of weld between stud and plate. *The weld is stronger than the strength of the stud.*

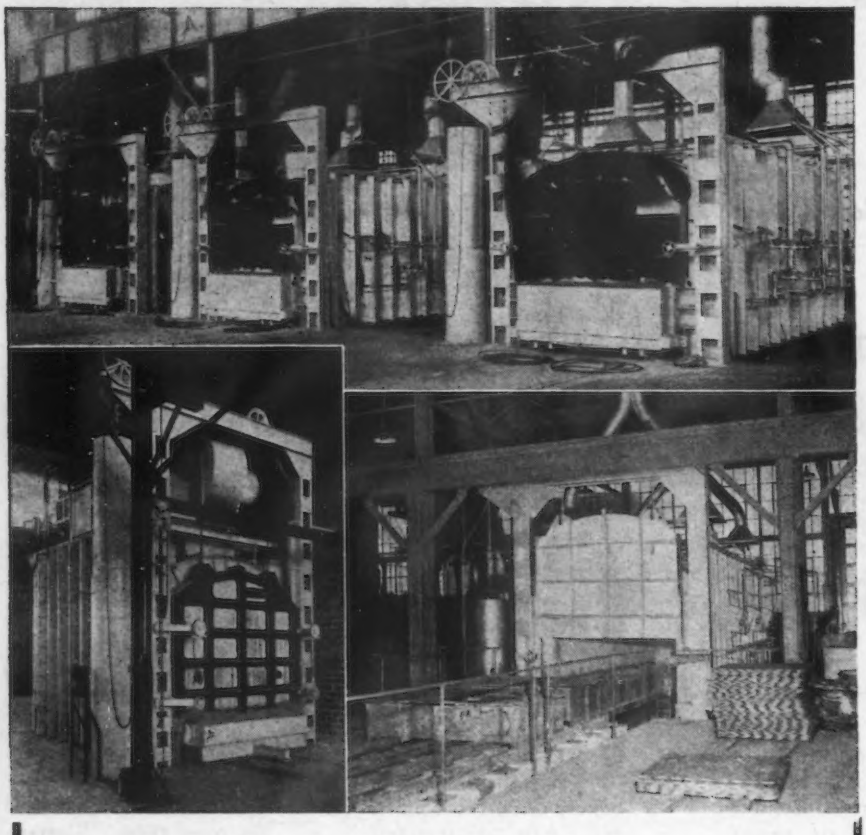
**NELSON SPECIALTY**
**WELDING EQUIPMENT CORPORATION**
**Dept. I, 440 Peralta Avenue, San Leandro, Calif.**
*Eastern Representative: Camden Stud Welding Corp. Dept. 122, 1416 So. Sixth St., Camden N. J.*

*30 years experience at your service*

**MAHR** CAR TYPE FURNACES

ENGINEERS • DESIGNERS • MANUFACTURERS ALL EQUIPMENT FOR METAL HEATING

For ANNEALING — CARBURIZING NORMALIZING — STRESS RELIEVING, ETC.



*The illustration at the top shows a battery of MAHR direct fired car type annealing furnaces that have been in heavy operation continuously for many years. At the left, below, is a recirculating car type stress relief furnace used in a Midwestern war plant for stress relieving castings and weldments. The car type at the right is used for carburizing heavy plate.*

No matter what your heat treating need is, MAHR can help you equip for it efficiently and economically. For over thirty years, the making of heat processing units of all kinds and types has been our sole business. That knowledge and experience is at your disposal. Our engineers will gladly consult with you and offer their recommendations.

Of course, we build all types of furnaces for every kind of heat treating in electric, gas, or oil firing, and either direct fired or recirculating as your needs may require.

→ WRITE or WIRE for FULL INFORMATION

There's a MAHR sales representative and engineer near you who is thoroughly qualified and anxious to give you complete information and offer individual suggestions to meet your needs. Write or wire today.

**MAHR MANUFACTURING CO.**

**Division of Diamond Iron Works, Inc., 1703 North 2nd St., Minneapolis 11, Minn.**



## *Peru to Build Steel Industry in Order To Eliminate Imports*

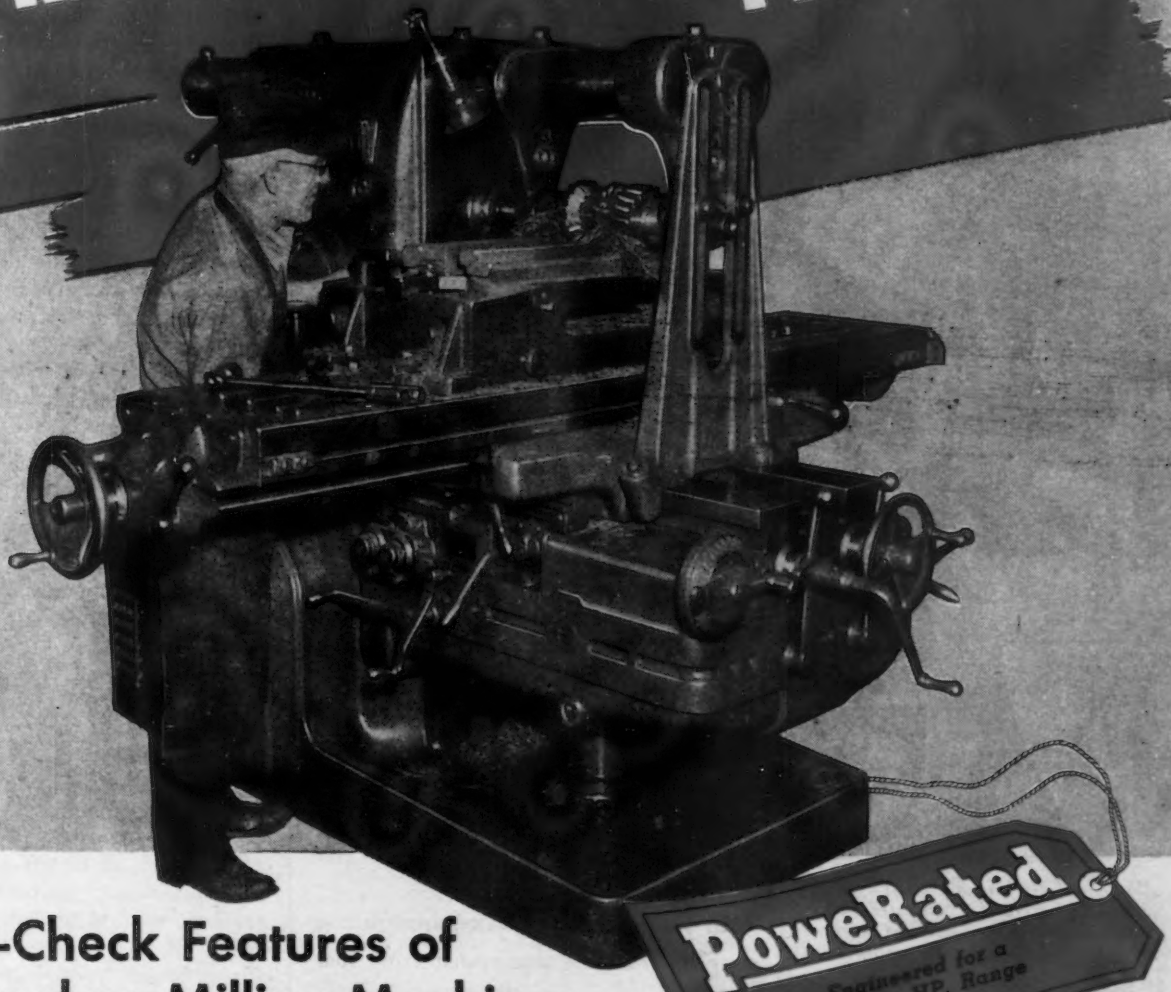
• • • **Towards the end of 1942 the** Peruvian Government signed an agreement with H. A. Brassert & Co., international iron and steel works builders, for equipping an iron and steel plant and coal mines in hitherto unexploited parts of the country. The capital to be invested amounts to some $15,000,000, which is to be made available from a credit of $25,000,000 granted by the United States to Peru through the Export-Import Bank.

Three areas are to be exploited: Marcona, about 10 miles inland from the bays of S. Nicholas and S. Juan, and about 250 miles south of Callao, where iron-ore deposits are to be mined; the Santa and Chuquicara valleys, 70 miles island from Chimbote, which itself, is some 200 miles south of Callao, where coal is to be mined; and Chimbote itself, where the port is to be developed and made the center of a fully-integrated steel industry. Some 4000 workers are to be employed during construction, and after completion 4000 to 5000 men will operate the plant.

The Marcona iron-ore deposits lie for the most part close to the surface. Of their total proved extent of some 10,000,000 tons, it is estimated that 6,500,000 tons can be mined easily by open cut methods. The existence of a further 40,000,000 of the largely low phosphorus ore is thought to be probable. It is intended to mine at the rate of 500,000 tons a year for 15 years. The initial mining development and the building of the means of transport to the coast were scheduled to take 18 months. The iron-ore deposits at Yaurilla, near Ica, and in the Tambo Grande area, 35 miles from Piura, have also been proved by Brassert's engineers, who have also found suitable limestone near the ore beds at Marcona. Since the new iron and steel industry planned for development on the basis of the Marcona ores will not consume the annual output of 500,000 tons, some of the ore may be exported to the West Coast of the United States.

Peru is distinguished among the South American countries by her comparatively large reserves of coal, including excellent anthracites. Total reserves are estimated at some 1000 million tons. The bituminous coals, however, lack coking characteristics, and are mostly far removed from the coast. On the other hand, the anthra-

# RANGE POWER PRECISION




## Double-Check Features of Milwaukee Milling Machines

Range in a milling machine — the capacity to handle a wide variation of operations at the most efficient feeds and speeds—is always an important factor.

But today — with advancements in cutting tools — motor hp. is the important feature to be checked when purchasing milling equipment. Be sure the milling machine you are considering is power-engineered to do the job — designed and built in relation to and with ample motor power for the work for which it is intended.

There is no need to resort to the unsound practice of substituting a higher hp. motor to gain power. The range of models of Milwaukee Milling Machines makes available a machine PoweRated and properly engineered for every class of job.

All Milwaukees are PoweRated — power-engineered in keeping with their rated motor hp. plus the normal overloads. They are precision-built and are capable of sustained precision-performance throughout a long productive life.

Remember — think of feed and speed range for light cuts — adequate motor power for heavy cuts — the need for sustained precision performance at all times. Check with a Kearney & Trecker field engineer in deciding which PoweRated Milwaukee is best suited to your specific needs.

**MEANS EVERY MILWAUKEE MACHINE IS POWER ENGINEERED TO DO THE JOB**

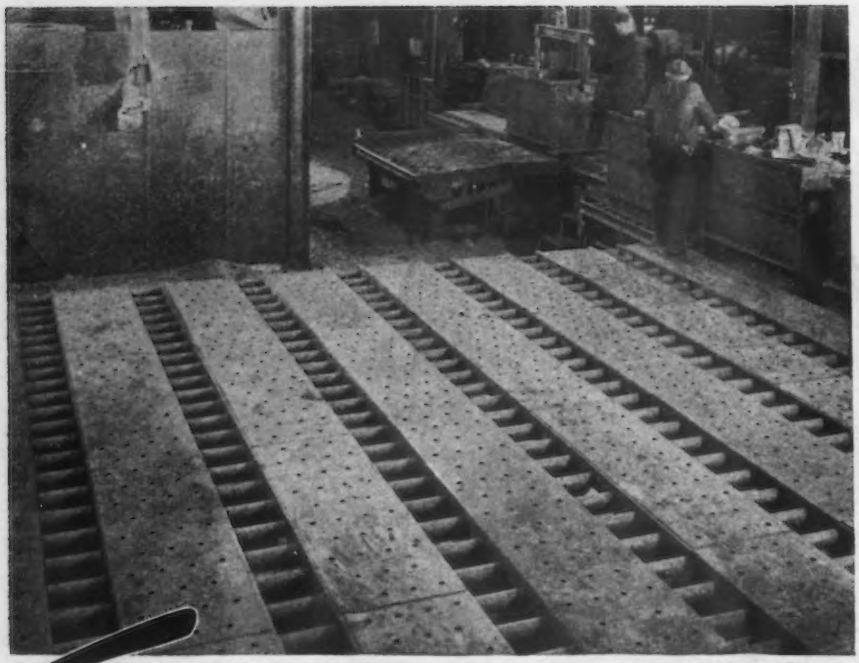
**Milwaukee PoweRated Milling Machines**

- **Standard Models — Horizontal, Vertical and Bed Types — available in Motor ranges from 3 to 25 HP.**
- **C.S.M. (Carbide Steel Milling) machines 20 to 50 HP.**
- **Special Machines—Consult K & T engineers.**

*Milwaukee Machine Tools*

**KEARNEY & TRECKER CORPORATION**

MILWAUKEE 14 WISCONSIN



# Save TIME, MONEY, MANPOWER!

*Above — "Push lines" of heavy-duty Logan conveyor installation in an Eastern steel foundry.*

*Above — This Logan transfer car, operating on rails, facilitates the transfer of heavy boxes of castings from one line to another.*

*Above — At end of conveyor lines, boxes of castings are received or deposited for easy transfer between departments.*

LOGAN *heavy-duty* Conveyor equipment helps to make hard jobs easy in this steel foundry. Roller conveyors and transfer car handle 3-ton boxes of castings from storage lines to cleaning machines *easily and economically.*

In *your* Plant, Logan equipment can simplify handling and transferring materials, parts and finished products all the way from receiving platform through processing, to storage or shipping — cutting costs, speeding operations, conserving irreplaceable manhours. Whether your operation involves heavy or light materials, you should know about the savings Logan equipment — conveyors of many types, turntables, transfer cars, spirals, ball transfers, etc. — can bring you. Write for free Catalog. Logan Company, 545 Cabel, Louisville 6, Kentucky.

*Send for this helpful Bulletin now.*

**Logan Conveyors**

**PUT *FLOW* INTO PRODUCTION**




cite deposits near Ancos and Galgada, in the Department of Ancos, are being actively mined both for home consumption and for export. However, the disposal of comparatively large quantities of small coal proved to be difficult. But it has now been shown that the breeze mixed with a little tar will yield an excellent metallurgical coke suited for both blast-furnace and foundry use.

The Ancos anthracite lies close to the coast, at a height of 4000 to 6500 ft. above sea level, but near the river Santa and its tributary, the Chuquicara, through whose valleys a narrow-gage railway runs to the mines. Seams vary in thickness from 2 to 8 ft., and one single existing mine is considered capable of satisfying all the requirements of the works at Chimbote. These needs are estimated at 500,000 tons a year of washed anthracite, of which 80,000 tons will be in lumps of 2 to 5 in. and the rest in various small sizes.

The Galgada anthracite is of very good quality, though its ash content is a little high. Its phosphorus content is lower than that of the best coking coals, and its sulphur is also very low. Analysis on a sample of about two tons gave the following results (per cent): Moisture, 3.15; volatile matter, 4.37; carbon, 84.01; ash, 8.47; sulphur, 0.83; and phosphorus, 0.016.

The port of Chimbote, where the steel plant is to be built, has one of the best natural harbors on the west coast of America. The important River Santo flows into the Bay of Chimbote, and provides for the area not only an admirable supply of fresh water—a valuable consideration on this arid coast—but also, in the narrows of Pato, opportunity for large-scale hydroelectric development. To improve the harbor, a mole about 1000 yds. long is now being built; when construction is complete, the port will handle vessels up to 17,500 tons.

The steelworks itself will comprise a battery of Curran-Knowles coke ovens, a blast furnace with a daily capacity of 100 tons, a Duplex steel plant, rolling mills for large and small products, and a foundry. The capacity of the plant has not been definitely determined. But it is intended to eliminate iron and to render unnecessary the further steel imports into Peru. These amounted to 40,000 to 50,000 tons annually before the war. There may be a surplus of iron or steel left for export to other South American countries, most of which are almost wholly dependent on imports.

*Tapping the crucible after the Thermit reaction in the welding of a large crankshaft.*

## STYMIED ON PRODUCTION OF *LARGE* FORGINGS?

These days the production of large, heavy forgings (or castings) often presents a problem. Facilities are limited. And in the case of castings, the larger the size the more the chance of imperfections; the more difficult the shipping and handling. The answer to this production stymie is the joining together of smaller forgings or castings by Thermit welding.

In the Thermit process there is no limit to the size of a weld. And you can fabricate "high tonnage" parts such as ship stern frames...propeller struts...crankshafts...steel mill rolls and similar heavy-duty units, with all the advantages of one-piece construction. In fact, the Thermit weld is as strong as a forging of the same cross-section.

Thermit welding may be done in your plant, by your own crew under supervision of M & T engineers, or at one of the Metal & Thermit plants.

For details, send for your copy of "Thermit Welding" today.

**THERMIT** *Welding*

**METAL & THERMIT CORPORATION, 120 Broadway, New York 5** · ALBANY · CHICAGO · PITTSBURGH · SO. SAN FRANCISCO · TORONTO

with EUCLID Cranes

Yes, cranes and hoists by EUCLID have an enviable reputation for "making light of heavy work" because they have been doing just that for many years in prominent industrial plants around the nation . . . day after day, year in—year out, frequently on 24 hour schedule.

High grade, wide face coarse pitch gearing is used throughout. Shafts are strong to withstand torsional stresses. Anti-friction bearings assure longer life and lower power consumption. Every part has a liberal factor of safety.

WE CAN DELIVER a limited number of 5 to 10 ton cranes in 60 to 90 days

EUCLID CRANES of standardized design, with all parts jig-machined to assure interchangeability, are built in capacities from 3 to 25 tons with spans from 20 to 100 feet. Larger and heavier cranes of greater capacity are built on special order.

Enlist the aid of EUCLIDS now and "make light" of your material handling problems.

THE EUCLID CRANE & HOIST CO.
1361 CHARDON RD., EUCLID, OHIO

## *United Nations to Meet To Discuss Postwar International Trade*

***Washington***

• • • **Eric A. Johnston,** president of the Chamber of Commerce of the United States and member of the Sponsoring Committee of the International Business Conference, announced recently that representative groups of outstanding business personalities from the United States and neutral nations will attend a worldwide gathering at the Westchester Country Club, Rye, N. Y., Nov. 10-18, to discuss postwar world trade and commerce.

"Governments are holding conferences on postwar plans," Mr. Johnston said. "Business, too, must get ready for the return to peace. It should go ahead with its own program.

"International trade is conducted mostly by business men. They know far better than any other group how it should be operated. Governments can do only so much. Business must carry on from that point."

Other members of the Sponsoring Committee which called the conference are: Eliot Wadsworth, chairman, American Section, International Chamber of Commerce; Robert Gaylord, president, National Association of Manufacturers, and Eugene P. Thomas president, National Foreign Trade Council. These men will select and will make public in the near future the names of the six United States delegates to the conference.

Although the International Business Conference is not officially sponsored by governments, Secretary Hull said in a letter that he regards the general purpose of the conference as highly desirable, in the sense that it would be very important in furthering the establishment of sound and forward looking postwar reconstruction policies.

Views of the sponsoring organizations, representing both small and large business concerns, already have been defined clearly.

These countries have been invited to the conference: Argentina, Australia, Bolivia, Brazil, Canada, Chile, China, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, Egypt, Eire, El Salvador, Great Britain, Guatemala, Haiti, Honduras, Iceland, India, Iran, Iraq, Mexico, New Zealand, Nicaragua, Panama, Paraguay, Peru, Portugal, Russia, Spain, Sweden, Switzerland, Turkey, Union of South Africa, Uruguay and Venezuela.

# LINE-ARC Contactor Control *for* BLAST FURNACE SKIP HOISTS

**Offers these outstanding ADVANTAGES**

1. Low initial investment.
2. Low stand-by renewal part inventory.
3. Low material and labor charges for upkeep.
4. Simplicity of construction easily inspected.
5. Safe, flexible, smooth operation under all conditions of load.

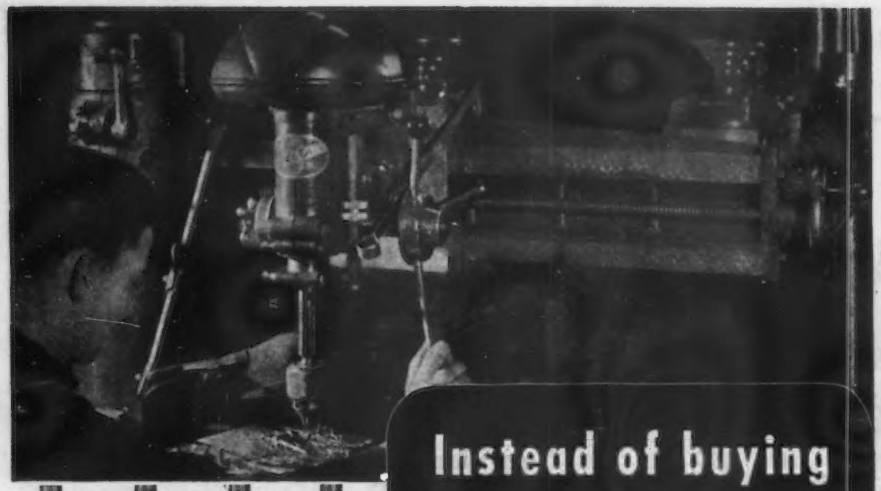
● Pictured below is one of two duplicate installations recently placed in operation at two plants of a large steel maker. Purchaser had learned from experience with similar installations in other plants that EC&M Control Apparatus and Control Engineering rank at the top for this important primary step in steel making. Accurate records over a number of years showed this control to be safe, economical, and efficient.

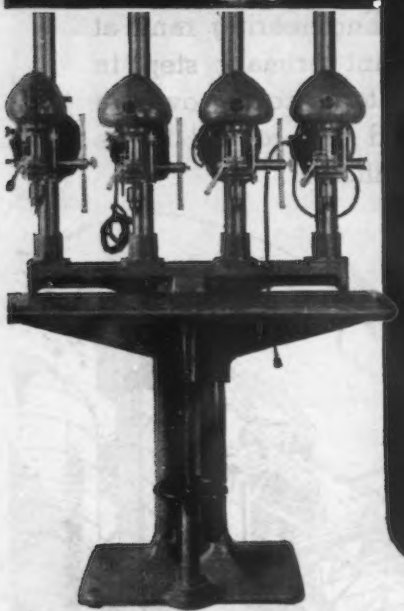
## *Consult*

Consult with our nearby office when considering control for Blast Furnace, Distributor-tops, Bell-hoists, Skip-hoists, etc.

**THE ELECTRIC CONTROLLER & MFG. CO.**

2698 EAST 79TH STREET — CLEVELAND 4, OHIO





Instead of buying scarce, costly *NEW* machines... consider modernizing *OLD ONES* with standard

**DELTA**

components — at a fraction of the cost

Today, when the conservation of machinery is so important, shop engineers are salvaging those parts that are still in good condition and replacing the worn units with standard Delta components.

The top illustration shows an old radial drill arm modernized with a 17" Delta drill-press head on a special mounting plate. The other illustration demonstrates how old, wornout heads were replaced by Delta 14" drill presses, thus saving the base and table which were still in good condition.

Perhaps you can apply this modern, economical method of modernizing machines in your plant that are approaching obsolescence. Make them dependable production units through the use of inexpensive standard Delta components. Also investigate the use of these low-cost components for building special-purpose machines that are quickly available, dependable, economical, and adaptable when conditions change.

**Delta's 76-page Blue Book Gives You 140 Examples**

— actual case histories in which special-purpose machines for war production were built around standard Delta components — low in cost, compact, readily available, quickly adaptable when requirements change. The same ingenious combinations can be used in reconverting for peace.

*Write for your free copy.*

MA-12

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DELTA MILWAUKEE Machine Tools

THE DELTA MANUFACTURING CO.
705L E. Vienna Ave., Milwaukee 1, Wisconsin

*Please send me my free copy of your 76-page Blue Book, and catalog of low-cost Delta Tools.*

Name..... Position.....

Company.....

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## CED Handbook Covers Postwar Credit Needs Of Business Concerns

*New York*

• • • **How business, and especially small business, may obtain the credit it is soon going to need in order to finance an anticipated 30 to 45 per cent increase in peacetime production and sales as compared with 1940, is the subject of a handbook, "Bank Credit: Your Postwar Program and Your Banker," issued by the Committee for Economic Development.**

The Postwar Small Business Credit Commission of the American Bankers Association is sending the book to approximately all the 16,000 banks in the United States. This will supplement the nation-wide distribution through CED's 2000 community committees in all parts of the country, as part of a campaign to bring local businessmen and bankers closer together.

"This businessman's program of information regarding bank credit," said Robert M. Hanes, chairman of the ABA Commission, "is of great benefit to the public and bankers alike. It merits the support and cooperation of every banker."

The book was prepared by the CED Financial Advisory Committee, of which Hugh H. McGee, vice-president of the Bankers Trust Company, New York, is chairman, and spells out this committee's slogan, "Think out loud with your banker."

In his foreword to the pamphlet, Mr. McGee, addressing himself to the businessman needing reconversion or other postwar credit, says: "Talk with your banker frequently; think out loud with him; give him your confidence; develop his confidence. That is the simplest, quickest and easiest way to obtain the credit you may need to carry out your postwar program."

Among the subjects covered in the handbook, in view of the special credit problems expected to result from great peacetime business expansion after the war, are: The nature of the businessman's relation with his bank; the kinds of loans banks can make; other sources of temporary credit and sources of permanent capital and long-term credit. The handbook may be obtained through any of the 2000 CED community committees.

# *in Induction Heating* ★ ★ ★ ★

## THE ELECTRONIC TOCCO MACHINE

Sets a new high standard in radio-frequency induction heating. A 20 K.W. unit for hardening, brazing, annealing or heating small parts . . . for hardening sharp contours such as cutting edges . . . for shallow surface-hardening. Advantages:

**FASTER.** Only electronic tube type induction heating unit with two work stations which can be set up for different jobs simultaneously for operation at same or different frequencies.

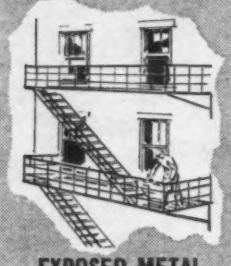
**A PACKAGED UNIT.** Completely self-contained in all metal cabinet. Floor area only 4′ 9″ x 4′ 3″. All sub-assemblies are easily accessible.

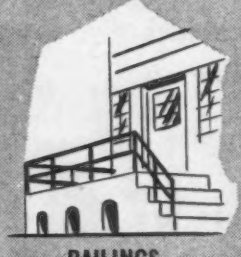
**RUGGED PRODUCTION MACHINE.** Power tubes and contactors are shock-mounted. Fully protected. No radio-frequency radiation. No high voltage hazards.

**TOCCO**

**INDUCTION**
**HARDENING . . BRAZING**
**ANNEALING . . HEATING**

METAL BUILDINGS


EXPOSED METAL


RAILINGS

WATER TANKS

PROPER repair and maintenance of many of the nation's industrial and commercial buildings has already been postponed beyond safety. Roofs have deteriorated; gutters, flashings, and other metal parts are rusting away. The situation calls for prompt protection! An easily applied, long-lasting, low-cost coating can, with minimum labor, stop this loss.

**CAREYCLAD COATING with ASBESTOS FIBRE**

meets these requirements for roofing as well as for exposed metal surfaces of steel tanks, bridges, heavy machinery, structural steel, etc. It is extremely durable, abrasion resistant and also resistant to acid, alkaline and salt atmospheric conditions. May be applied by brushing, dipping or by spraying if proper equipment is available.

CAREYCLAD forms a continuous, one-piece coating over the entire surface on composition or metal roofs. It is not subject to alligatoring, hair-cracking, pinhole formation, slipping or sliding. Weather-Ometer tests have shown that CAREYCLAD has a life at least 100% greater than the high grade coatings tested and from three to twelve times greater than the medium and cheaper grades. This longer life means an important labor saving over coatings that require more frequent application.

On your next order, specify CAREY Coatings, Roof Cements and Flashing Cements for lower cost repairs and protection. Write Dept. 26.

THE PHILIP CAREY MFG. COMPANY
Dependable Products Since 1873
LOCKLAND, CINCINNATI, OHIO
In Canada: The Philip Carey Co., Ltd. Office and Factory: Lennoxville, P. Q.




## *Trade Association Award Presented To Cleveland Organization*

***Cleveland***

• • • It has been announced by the United States Department of Commerce that the National Screw Machine Products Association, Cleveland, has been awarded first prize in the American Trade Association Executives 1944 Award, the annual competition for outstanding achievement and service to industry. Announcement was made by Secretary of Commerce Jesse H. Jones, chairman of the Jury of Awards. Winners in this competition were selected by a jury of four consisting of Eric Johnston, president of the U. S. Chamber of Commerce; Robert Gaylord of the National Association of Manufacturers; Linwood Noyes of the American Newspaper Publishers Association; and Franklin Snyder of Northwestern University.

Quoting from the Department of Commerce release:

"First prize winner in the smaller associations class was the National Screw Machine Products Association, based on its aggressive war adjustment and postwar planning activities. Formed in 1924, its executive secretary is Orrin B. Werntz of Cleveland, Ohio.

"Among the products of this industry are minute, exactingly-made parts for airplane engines and other machinery and equipment needed in huge quantities by the Armed Forces.

## Purchasing Clinics To Study Business

• • • The first of a series of 63 "post-war purchasing clinics" to be held throughout the country to assist business, and especially small businessmen, in meeting their purchasing problems in the reconversion period took place recently in New Orleans under the joint auspices of the local Purchasing Agents Association of New Orleans and New Orleans Committee for Economic Development.

This nation-wide series of panel discussions, to be held in all 63 cities in which NAPA has locals, has been undertaken in cooperation with the national Committee for Economic Development. It will consist of discussions of the following subjects, especially in their local application: 1. Settlement of terminated war contracts. 2. Disposal of government-owned surpluses. 3. Lifting of wartime controls.

# *New Book* on Tools for Obtaining Accurate Thread Forms in Less Time

Remarkable savings are being made in thread grinding through the use of the new Tru-Thread Diamond Tools for dressing thread grinding wheels.

Tru-Thread Diamond Tools employ a radically new principle, applied for the first time by Wheel Trueing engineers, and utilize the hard characteristics of a diamond of a shape never before used for such a purpose.

The results of this new development are reported by users who tell us—for example—that with Tru-Thread Tools they are running three to four times as many pieces as they obtained with their previous tools.

Tru-Thread Tools obtain wheel forms quickly and accurately and leave the wheel grain sharp and free-cutting. Wheels cut clean, hold their form longer and grind more pieces between dressings. Wheel cost, tool cost, and cost per piece all are reduced accordingly.

These tools, which are made in types for dressing each specific form, are completely described and illustrated in a new booklet which we will be glad to send you on request. If you have thread grinding equipment, this booklet will point the way to substantial savings. Send for your copy.

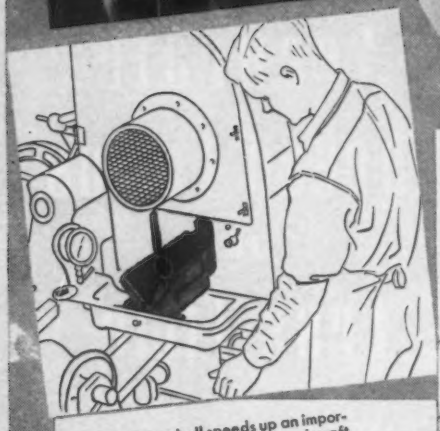
**WHEEL TRUEING TOOL COMPANY**

3200 W. Davison Avenue
Detroit 6 • Michigan

575 Langlois Avenue
Windsor, Ont. • Canada

*left:* A Campbell Abrasive Cutting Machine cutting Aluminum Bar Stock on a war production job.

*below:* A Campbell is used for precise job of cutting in plant of nationally-prominent manufacturer of bearings.



*above:* Campbell speeds up an important tube cutting job in an aircraft factory on the Pacific Coast.

*above:* Precision set-up in a manually operated Campbell Abrasive Cutting Machine in a war production plant.

## WHAT IS *YOUR* CUTTING JOB?

These 4 **CAMPBELL ABRASIVE CUTTING MACHINES** are all different. Each is cutting different stock to different dimensions —none limited to the job it is doing.

**CAMPBELL** has the only complete range of Abrasive Cutting Machines—cutting annealed and unannealed steels, non-ferrous alloys, plastics, glass and ceramics—solid bar, tubular and flat stock.

What are you cutting? Can **CAMPBELL** give you a procedure that will do the work better, make it easier to meet schedules and lower costs?

You can find that out by writing the Andrew C. Campbell Division. State what material you are cutting, length of pieces before cutting, length of cut-off pieces and production required per hour.

*Campbell*

**ABRASIVE CUTTING MACHINES**

**ANDREW C. CAMPBELL DIVISION**

**BRIDGEPORT • CONNECTICUT**

ALSO MAKERS OF A COMPLETE LINE OF NIBBLING MACHINES

ACCO

AMERICAN CHAIN & CABLE COMPANY, Inc.

BRIDGEPORT • CONNECTICUT




## *Visual Control Board Developed by Wright Hastens Terminations*

***New York***

• • • **The necessity of speeding contract termination due to rapidly changing requirements of war calling for new types of equipment and weapons, has been met in a unique method by Wright Aeronautical Corp. at its Cincinnati plant by installation of a visual control board system known as Produc-Trol, scheduling dates and steps in reconversion while eliminating the former method of ledger control.**

**The company stated that large scale conversion of war contracts has speeded-up its terminations in a fraction of the usual time. In two instances involving recent terminations or conversions, the Wright plant has predetermined schedules for $128,000,000 and $50,000,000 terminations in the short time of 105 and 90 days respectively.**

**The system, which is open to all manufacturers upon request, still includes the regular procedures of handling nearly 1000 vendors and about 15,000 purchase orders at one time. Its speed and efficiency, however, rests in the method of scheduling the various steps involved in a termination, keeping track of the progress made from day to day and giving an overall picture at any given moment.**

## OPA Revokes Order L-217 And 10 Remaining Schedules

*Washington*

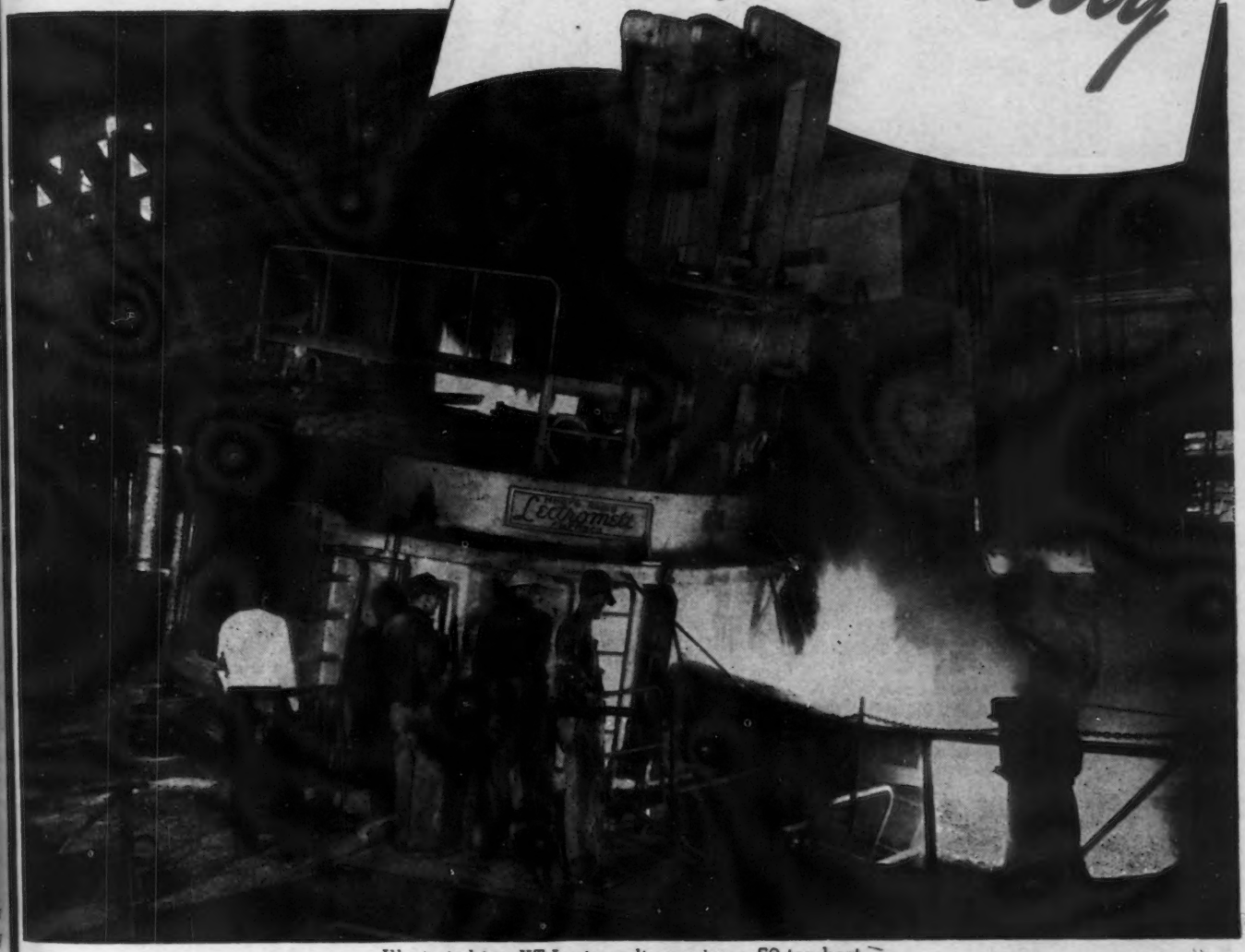
• • • **WPB recently revoked Order L-217, the construction machinery and equipment simplification and conservation order and its 10 remaining schedules, which limited the manufacture of the items to certain sizes or types.**

The 10 revoked schedules follow:

Schedule 2, portable jaw and roll crushers; 5, portable construction concrete mixers; 6, truck mixer-agitators; 7, pumps; 9, tank car heaters and pumping boosters or circulators; 10, bituminous paving finishers; 12, bituminous heating kettles; 13, bituminous materials maintenance units; 14, bituminous patch plants, and 15, asphalt surface heaters.

The revocation of the remaining 10 schedules and the basic order itself removes former manufacturing restrictions on sizes and types. However, WPB officials pointed out, the

# Lectromelt for flexibility



Illustrated is a KT Lectromelt, pouring a 50 ton heat.

Flexibility is but one of the many advantages of the Lectromelt furnace as it can be operated on either cold scrap or hot metal charges. Large or small heats may be made as desired or part of a heat may be taken out and the analysis of the remainder altered as required.

The ability to make any analysis of ordinary or alloy steels and irons enables Lectromelt users to facilitate production of diversified orders, a distinct advantage to mills and foundries requiring a wide variety of analyses.

Lectromelt's quick top charge feature reduces the furnace loading time and increases tonnage per man hour. Complete details mailed upon request.

LECTROMELT FURNACES RANGE FROM 100 TONS TO 25 POUND CAPACITY

MOORE RAPID

Lectromelt

FURNACES

★ ★ ★

PITTSBURGH LECTROMELT FURNACE CORPORATION

Pittsburgh 30, Penna.

ARMSTRONG
Even the new apprentice starts with a "world" of experience
Even the "greenest" operator starts with a world of experience if you furnish him with the correct ARMSTRONG TOOL HOLDERS. His cutter will always be at the most efficient cutting angle, his "tool approach," the most convenient and accurate. His tool will have the requisite rigidity or resiliency—if it's a thread-cutting operation the cutter form will be exact and accurate, and he will be able to operate at speeds and feeds unheard of a generation ago.
Used in over 96% of the machine shops and tool rooms of America, in all parts of the world wherever metal is machined, ARMSTRONG TOOL HOLDERS embody the world's experience in cutting tool design, developed, refined and proven by ARMSTRONG'S 50 years of specialization in cutting tools for lathes, planers, slotters and shapers.
Let this world experience increase your efficiency, use the correct ARMSTRONG TOOL HOLDERS for each operation—they are stocked by your local mill supply house.
ARMSTRONG BROS. TOOL CO.
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309 N. Francisco Ave.
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199 Lafayette St., N. Y.
Buy ARMSTRONG TOOLS from your Supply House
ARMSTRONG TOOL HOLDERS Are Used in Over 96% of the Machine Shops and Tool Rooms




items covered by the schedules are still subject to production and distribution control under Order L-192. Producers of these items are required to obtain authorization to produce them on WPB Form-1689.

## AWS Annual Meeting To Feature 60 Papers

• • • **Seventeen technical** sessions embracing more than 60 papers on welding subjects will feature the 25th annual meeting of the American Welding Society to be held in the Hotel Cleveland, Cleveland, Oct. 16 to 19. As in past years, the meeting is being held in conjunction with the National Metal Congress.

Subjects will cover welding problems in heavy industry, railroads, shipbuilding, structural fabrication, aircraft, foundry, machinery and piping and pressure vessels. Several sessions will be devoted to resistance welding and to research, long a prominent feature of AWS meetings. More data are to be presented on the weldability of steels and although less emphasis is being placed this year on ship failures, the subjects of welding sequences and stress relieving in general applications are not being overlooked.

The Adam's lecture will be delivered by Dr. A. B. Kinzel, Union Carbide & Carbon Corp., whose topic is "Solid Phase Welding." At the opening session on Oct. 16, Adm. H. L. Vickery, U. S. Maritime Commission will speak concerning the use of welding in shipbuilding; Col. S. B. Ritchie, U. S. Army, of its use in the fabrication of ordnance equipment, and W. B. Stout, Consolidated Vultee Aircraft Corp., on welding in aircraft production.

## 3600 Returned Veterans Work at General Electric

*Schenectady*

• • • **Thirty-six hundred service men** who entered the armed forces since Pearl Harbor and have been honorably discharged from active duty are now working for General Electric, according to Charles E. Wilson, president. Of these, 2300 are former employees and 1300 were not previously employed by General Electric. Records show that 48,848 of the company's employees have been called into service and that 469 have lost their lives or are reported missing in action.

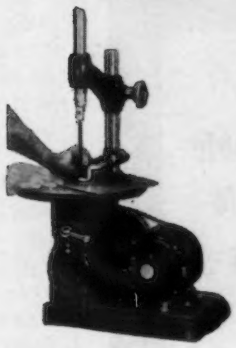
"As our employees come from the armed services we will have jobs awaiting them," Mr. Wilson declared.

# 3 JOBS WELL DONE *on the*

# ILLINOIS DIE FILING MACHINE

**1 - FILING**
Designed for filing of intricate die shapes... table can be tilted to right or left up to 20° from horizontal. Hand files can be used.

**2 - SAWING**
The table has a removable ring insert so that shank sizes of saws and files up to 6" length can be accommodated. Saw guide may be utilized as a hold-down finger.



**3 - STONING**
A finishing stone can be installed easily and quickly — which emphasizes the utility of this versatile machine that performs three major production steps: filing, sawing and stoning.

## *RAPID AND ACCURATE PERFORMANCE OF CRITICAL FINISHING OPERATIONS*

PRECISION and BALANCE mark the Illinois Die Filing Machine which is designed to save time and do a superior job on finishing intricate die shapes. Convenient and adaptable, it is built with extreme precision and durability. Working parts are hardened and ground for accuracy and long life. Automatic forced feed lubrication reduces wear to a minimum. The Illinois Die Filing Machine relieves tedious hand filing of intricate shapes and assures greater accuracy at lower cost. Write for descriptive literature, today!

Overnight to All America . . . From the Hub of Air Transportation.

ILLINOIS PRECISION METAL CUTTING TOOLS
Shaper Cutters
Ground Hobs
Milling Cutters
Breaches
Ground Form Tools
Special Tools . . . Gear Measuring Machines . . . Gear Measuring Blocks

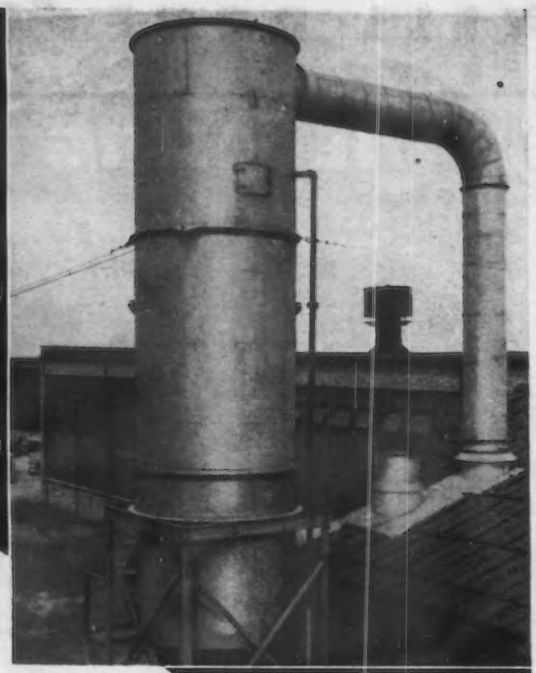
# ILLINOIS TOOL WORKS

2501 N. KEELER AVE. CHICAGO 39, ILLINOIS

In Canada: Canada Illinois Tools, Ltd., Toronto, Ontario

MANUFACTURERS OF METAL CUTTING TOOLS AND SHAKEPROOF PRODUCTS

# WHEN "COST-PLUS" ENDS-



"Cost Plus" contracts do not demand low maintenance expense. This has been overlooked by some, who have installed dust collecting equipment of the cheaper class without regard to post-war cost of operation and repairs. But "Cost Plus" must end with the coming of peace.

Many plants, looking forward to the postwar period, have selected Schneible Multi-Wash Dust and Fume Collecting Equipment for that reason.

***Safety is another valuable characteristic of Schneible equipment***

Long range planning in industry means Schneible dust and fume control equipment, which is engineered and built to serve indefinitely with nominal attendance and minimum maintenance. *There are no parts to break, burn, clog or rapidly wear.*

Schneible does not make a cheap, secondary line of dust collecting equipment. Every unit is made to standard, high efficiency design. These standard units are available for every requirement —from an individual dust creating operation to ventilitating an entire plant.

Write for bulletins showing installations in many types of metal working plants.

## CLAUDE B. SCHNEIBLE COMPANY

2827 Twenty-Fifth St., Detroit 16, Mich.

*Engineering Representatives in Principal Cities*

SCHNEIBLE




## *Olrich in Discussion Of Postwar Surplus Property Disposal*

***Washington***

• • • In a statement issued recently by E. L. Olrich, assistant to the Secretary of the Treasury in charge of procurement, before the Truman Committee, the subject of surplus property disposal was thoroughly discussed. According to Mr. Olrich:

"The problem of disposal of property surplus to the needs of the government is not a new one. Various arrangements have existed in the past 25 years for the purpose of disposing of such property. Most recently the Federal Property Utilization Branch of the Treasury Procurement Division was established to carry out the provisions of Executive Order 9235, dated Aug. 31, 1942, providing for the effective conservation and utilization of all types of property owned by the federal government. The branch has set up 11 regional offices throughout the country.

"During the first year of the Federal Property Utilization Branch's existence, the principal source of surplus property was government agencies outside the military. Disposal was effected to federal agencies, non-federal tax-supported agencies, and commercial channels. Most of the property was of such a nature that it could be consumed by some federal agency. The emphasis during this first year was in a sense more on conservation and utilization than on disposal.

"During the year ending June 30, 1943, federal surplus property valued at $8,555,000 was disposed of by transfer to government agencies, and property valued at $521,000 was disposed of by sale. This represents a total of $9,076,000.

"During the past year," Mr. Olrich continued, "the picture has changed radically. The principal source of surplus property handled by the Federal Property Utilization Branch of the Treasury Procurement Division has been the various military services. Surplus property declarations have increased greatly in variety and quantity. The problem has changed from one largely of utilization to one mainly of disposal. Commercial channels, rather than government agencies, have become the chief market for surplus property.

"Executive Order 9425, dated Feb. 19, 1944, established the Surplus War Property Administration and named

**They <u>both</u> need protection!** . . . It's a big responsibility—supplying protection to floors as well as trained personnel. "A.W." Rolled Steel Floor Plate makes floors rugged, permanently safe—despite hours of punishing wear. No worn or slippery surfaces to endanger men on foot. Shown above is the "A.W." Super-Diamond Pattern which resists slipping in *any* direction. Plate can be cut and installed almost overnight without disturbing production. Write for folder.

*Other products include Plates, Sheets, Billets, Blooms, Slabs—Carbon, Copper or Alloy analyses.*

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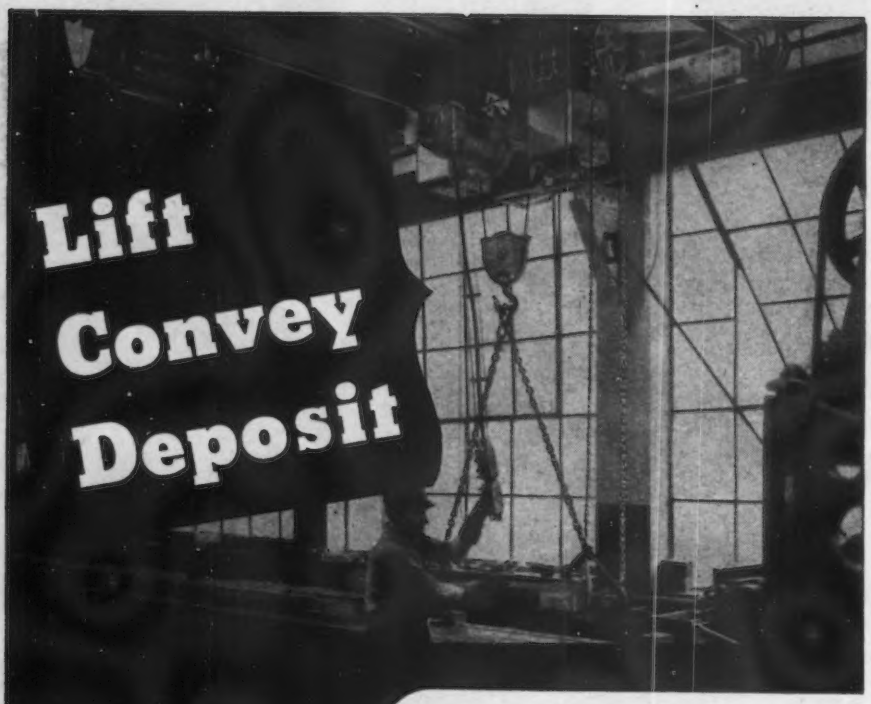

# Lift Convey Deposit

Shepard Niles "Liftabout" general utility hoist, equipped with push-type trolley. Where accurate spotting is desired, hand-racked trolleys are recommended. Where considerable distance and fast travel speed is needed, a motor-driven trolley is an economical investment.

THE purpose of a hoist is to lift, convey, and deposit materials. Sounds simple, doesn't it? However, in choosing the right type of hoist for any given job, many conditions must be given thorough study.

Weights of loads, speed and distance of travel, both vertical and horizontal, as well as frequency of use are among the many factors which must first be considered for maximum hoist efficiency.

Perhaps your materials handling problem is one which requires complete coverage of a large area. If so, a Single Beam Hoist, in conjunction with a Single Beam Crane, shown above, will do the job. Or, if your requirements are for lifting only, a bolt-suspended hoist is the answer.

Whatever *your* materials handling problem, you may rest assured that Shepard Niles has the correct equipment for you. Put your problem up to a Shepard Niles representative.

*Write for Bulletin No. 127.*

Motor-driven, Close Clearance or Low Head Room Hoist. Available with either push-type, hand-racked or motor-driven trolleys.

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the Procurement Division of the Treasury Department as one of several disposal agencies. This order did not change the situation much as far as the Procurement Division was concerned except to make it subject to the direction of the Surplus War Property Administration and revise the categories of property to be handled by it.

"However, it became clear at this time that the Federal Property Utilization Branch of the Procurement Division was not organized in a manner adequate to carry the much heavier load to be placed on its shoulders in the future. Since that date, therefore, efforts have been directed at (1) attaining proper disposal of the increasing inventories of surplus and (2) at the same time building an organization capable of handling the vast quantities of property which will presumably be declared surplus upon the cessation of hostilities in Europe.

"That these efforts have been to some degree successful is indicated in the ten-fold increase in disposals for the year 1944 over the year 1943. In the fiscal year from July 1, 1943, to June 30, 1944, transfers to government agencies totaled $23,876,591 and sales $64,383,426, a grand total of $88,260,017.

"The major problems faced during the past few months have been concerned with developing (a) an organization structure and a personnel force capable of efficiently carrying on the surplus property disposal activity and (b) an adequate system of inventory control.

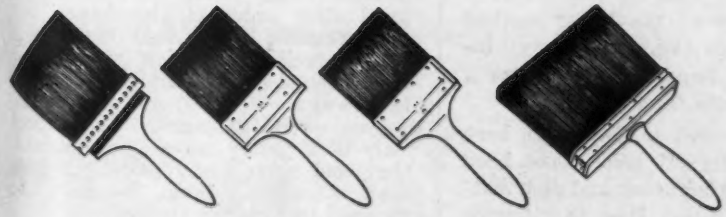
"We have gone a long way, but by no means all the way, in the solution of these problems. A staff of men from the field of business with considerable experience in marketing the types of property which we are being and shall be called upon to dispose of have been added to the Washington organization. Likewise, personnel highly skilled in the fields of accounting, control, and operating, have been added. The headquarters organization has been set up for maximum efficiency. The regional office organizations have been and are being overhauled with a view to improving their operations.

"A system of inventory control satisfactory for a volume of a few million dollars is inadequate for a volume running into scores and hundreds of millions. A new system is therefore currently being installed on a nation-wide basis so that disposal activities can be carried on with an

NORTHERN ILLINOIS STATE COLLEGE • *Painted and Decorated by*—FLOYD WEYMER, *Contractor*, LINCOLN, ILL.

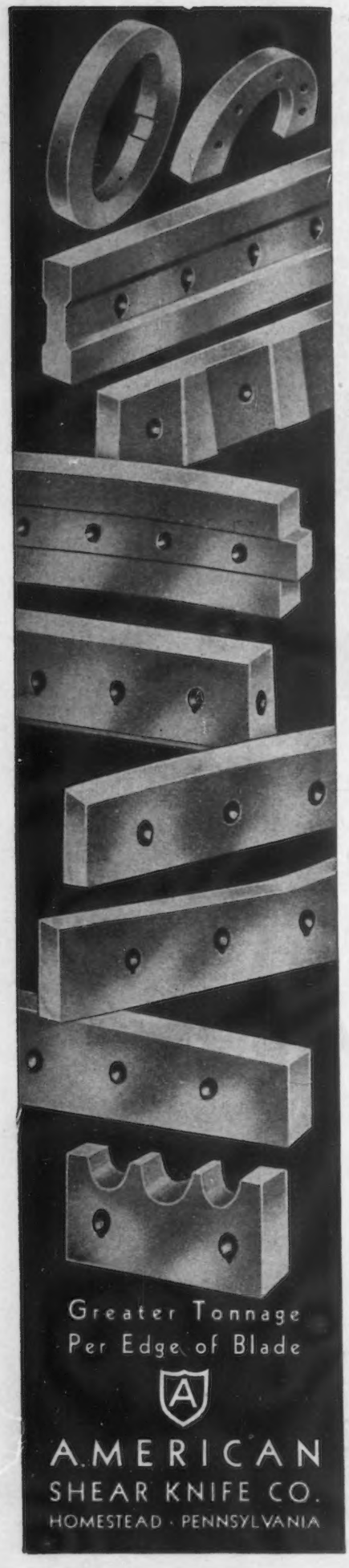
# —*with* NEOCETA *Brushes*

## the proved new painting medium



PITTSBURGH
PLATE GLASS COMPANY

BRANCHES IN ALL PRINCIPAL CITIES—FACTORY AT BALTIMORE—29, MARYLAND






exact and detailed knowledge of the inventory situation at all times.

"Other important problems have involved (a) insuring small business concerns an opportunity to participate in the surplus property disposal program; (b) finding markets for certain types of property; and (c) allocating property in short supply equitably to all purchasers desiring to buy.

"Insuring small business concerns an opportunity to participate has been effectively solved for the most part by offering property for sale in lot sizes small enough to be attractive to such concerns and by advertising offerings to all concerns which have expressed a desire to be informed regarding them.

"The problem of finding markets for certain types of products has not been so easy of solution. Some items are difficult to sell because they have been manufactured for military purposes and have no equivalent product for civilian use. An example is special nets for mine sweeping or emergency snow shoes. Other items with a civilian use have been altered in design to make them adaptable to military purposes. The change in design prohibits ready sale to the civilian market. An example is aircraft cameras.

"Among other drawbacks, from the disposal standpoint, of consumer goods made to military specifications are, (a) they are frequently marked or stamped with military insignia—as in the case of Army blankets, (b) they are either too big or too heavy for civilian consumer use—as in the case of over-sized (7½ ft.) skis or extra heavy bicycles, or (c) are packaged in types of containers and quantities that are either too large or too small for consumer or industrial use—as in the case of many medical and chemical preparations.

"The problem of making an equitable allocation of property in short supply to purchasers desiring to buy has been solved in part by acquiring information as to the relative needs of prospective purchasers and acting accordingly, and in part by the obvious method of drawing lots publicly. Unsatisfactory as the latter method may seem to be, in many instances it is impossible to devise a useful substitute for it.

"It may be well to emphasize here that practically all sales have been made to manufacturing and distributing concerns rather than to ultimate consumers. It would be uneconomical to attempt to distribute directly to millions of consumers, not to mention the difficulties which would be involved

*(Advertisement)*

## Many Postwar Items To Be Galvanized

By GEORGE H. OHMER
*Chief Engineer*
*Dayton*

. . . Scores of new postwar products are being designed to utilize galvanized sheet metal for the first time now that arc and gas welding, in place of riveting and soldering, have been made practical by the Galv-Weld process.

*IMPORTANT APPLICATION: Electrolysis of welds on vital radar equipment prevented by the use of Galv-Weld process and alloy.*

One large eastern producer of air conditioning equipment has already abandoned the practice of riveting and soldering galvanized sheet metal and has turned to gas welding, the welds being regalvanized by this process at the time of welding. Galv-Weld alloy has already increased the production of this company by making it possible to press form most galvanized sheet metal pieces. Fractures in the galvanized coating, due to forming, are easily regalvanized with Galv-Weld. Lower costs and a finer quality product have accordingly accompanied the change.

Since Galv-Weld process is not confined to sheet metal work alone, nearly every industry is seeing the opportunities afforded by the process.

Railroads are using Galv-Weld alloy for construction and repair of galvanized water tanks, signaling systems and towers, steel work buildings, piping, etc., while the petroleum industry has been quick to see the need for it in the maintenance of galvanized refinery equipment in place of periodic painting. The alloy is not affected by corrosive and acid-bearing fumes in refinery areas.

Throughout the shipbuilding industry, for nearly three years, the alloy has been specified as a means of regalvanizing welds made in galvanized sheet, plate and pipe.

All-welded galvanized steel bridges, towers, storage tanks and other structural steel products also have been made feasible by the Galv-Weld process, as well as being a "must" for underground storage tanks where protection against corrosion is paramount.

Commercial galvanizers are finding Galv-Weld alloy saves considerable time and money in repairing rejects that otherwise would normally be stripped and re-hot dipped.

Those whose present or postwar product can utilize galvanized sheet, plate or pipe can obtain full details on the process and alloy by writing Galv-Weld Products, Dayton 10, Ohio.

# All over the Home Front

## ON REPAIR AND MAINTENANCE WORK

## P & H HARMOMANG

A Proved Electrode For *high* Resistance to Impact, Abrasion and Wear

Harmomang is an electrode with the work-hardening qualities which suit it especially for the building up or hard surfacing of manganese and carbon steels.

It is a coated moly-manganese electrode with a hardness range up to 43-46 Rockwell "C". It can be used on AC, or for either straight or reverse polarity on DC.

Harmomang is the ideal electrode to use wherever you need protection against both impact and abrasion. For example: for hard surfacing dipper lips, dipper teeth, bucket runners, rock crushers, railway frogs or wherever longer life is desired for parts made of manganese or carbon steels.

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BEHIND Fairfield's Gears is a multiple assurance of the accuracy universally demanded of gears. Fairfield has been making fine gears for more than 25 years—for leading manufacturers of industrial, agricultural and transportation equipment. Modern and complete facilities for processing and testing gears characterize the Fairfield plant. Technical skill marks the engineers and craftsmen. By familiarizing yourself with Fairfield's gear making and engineering services you will learn of the advantages offered.

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in attaining such distribution on an equitable basis, that is, in giving all interested consumers a fair chance to purchase.

"Sales have been confined so far as possible to regular channels of trade. In some instances, buyers have been asked to certify that they are regular dealers. In general, however, sales have been confined to regular channels, that is, channels customarily handling the property, by the more indirect method of advertising offerings as widely as possible and refusing to sell at prices which have seemed to be too low. Non-regular dealers are usually, but not always, interested in buying at prices lower than "market." If a non-regular dealer is willing to pay more for goods than a regular dealer at the same trade level, it seems fair to sell to the non-regular dealer provided the offered price is within the established "ceiling."

"Sales have been made by three methods: Sealed bids, negotiation and auction. The sealed-bid method has been used far more than the other two. This method has an appealing element of fairness about it and seems to be the "safe" method to use to insure all interested buyers an opportunity to participate. Actually this method is not attractive to many potential buyers and it does not ease the problem of equitable allocation when there are more bidders at ceiling prices than there is property to be distributed. Recently there has been greater emphasis on the negotiated-sale method because, if carefully employed, it can result in distribution as equitable as the sealed-bid method, and because it may bring a higher price and involve less expense. Finally, it has the marked advantage of speed at a time when every effort is being exerted to see to it that merchandise in short supply reaches the hands of consumers as quickly as possible. Not only does this speedy movement of property at the present time serve the very commendable purpose of satisfying urgent consumer needs but also it probably results in a higher return to the government. Further it decreases the amounts of property which may hang over the market in perilous fashion in the years ahead.

"The auction method has been resorted to in the case of property customarily sold by this method, such as horses, and of property available in heterogeneous lots where sale by either of the other two methods would be slow, cumbersome and uneconomical.

"In instances where we have inventories of merchandise in large quantities, we test the market in order to ascertain its capacity for absorbing our offerings without inflicting undue injury on the producing and distributing activities of the industries involved. In the case of some types of property, surpluses will probably be declared in amounts equal to two or three years' normal output of the industries involved. We are initiating studies which will give us an idea as to what the effect of releasing these surpluses at various rates will be. We shall constantly keep in touch with business groups in order that we may obtain their views as to what the effect of our decisions on their industries will be.

"Many of the problems faced by the procurement division to date will continue to be present in the same or different form in the months and years ahead. For example, there will always be an organization problem. For one thing, it may be difficult to obtain the services of competent personnel in the face of competition for their services from private business. For another, there will be the problem of adapting the organization to the needs of changing conditions. In the immediate future, the field organization must be expanded to afford proper approach to every important market of the country. The present regional-office setup, based originally on the concentrations of government surplus property, is quite different from the setup necessary to attain more adequate and equitable geographic distribution of all types of consumer goods.

"There will continue to be problems connected with the disposal of types of property for which there is normally little or no civilian demand. Ingenuity will be called on to devise profitable uses for such property but frequently disposal at a loss must be accepted as inevitable. There will also continue to be the problem of insuring small-business participation in disposals, of selecting advertising and publicity methods which will result in widest dissemination of information, of keeping property out of the speculative and in the regular channels of trade, and of allocating surplus in short supply among customers who want to buy.

"Such problems are minor, however, when compared with the problems of a more fundamental nature yet to arise. That disposal policies and methods can have profound effects on the national economy later on seems indisputable.

Carboloy Sheet Metal Dies offer a new, higher order of quality and economy on your sheet metal drawing. You get more continuous press operation, close tolerance during long periods of use, and a finish almost "mirror-like" in quality.

Cemented Carbide—the hardest metal made by man—makes this possible because it has an extreme resistance to abrasive wear. It keeps operating long after ordinary dies fail. Easy to use; easy to maintain. Free factory training course for your die room personnel on latest, most efficient methods for carbide die maintenance.

Plan now to get these outstanding advantages of Carboloy Sheet Metal Dies on postwar production. Available in hole sizes up to 16".

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# Regional WPB Denies Union Proposal in Foundry Wage Rate Case

***Chicago***

• • • **Union proposals that a stabilized foundry wage rate 10c. higher than the metal trades bracket be established for the six-state region centering in Chicago have been denied by the Sixth Regional War Labor Board but higher rates have been set in the Racine-Kenosha and Springfield-Decatur labor areas.**

**In the Racine-Kenosha, Wis., area the board raised the common labor rate from 70c. an hr. to 80c., the existing stabilized common labor rate in the metal trades industry. In higher job classifications the increase tapers to 5c.**

**In the Springfield-Decatur, Ill., area increases ranged from 2c. an hr. to 25c. an hr. in various classifications. In the old stabilized rates, the starting rate for common labor was 55c. an hr. with 60c. after 30 days and 65c. after 90 days. The new rates have a starting rate of 62c. an hr. for common labor and a progression to 67c. an hr. after 30 days. The largest increases were for coremakers, hand, bench, Class A, which were raised from 80c. to 1.05 an hr., and moulders, hand, bench, Class A, which were raised from 85c. to 1.05 an hr. These larger increases in the rates for coremakers and moulders were based on the fact that the old rates were low in these classifications and based on old data.**

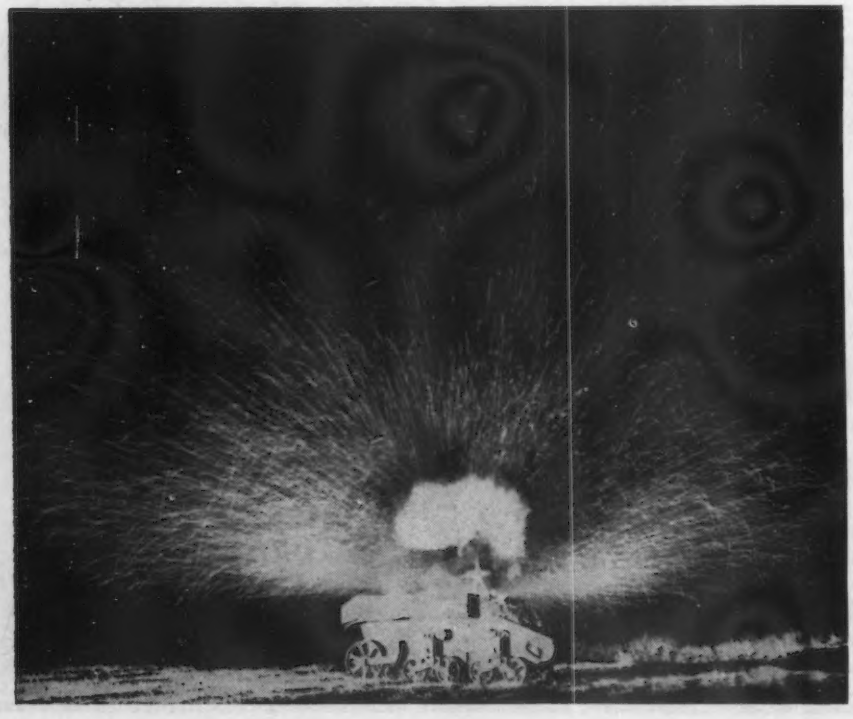
**The Wage Rate Committee will proceed immediately to make any justified changes in the stabilized rates for other labor areas including Milwaukee, Minneapolis, St. Paul, Chicago, Indianapolis and others.**

**Before setting the new stabilized rates for Racine-Kenosha and Springfield-Decatur areas, the Regional WLB voted down a proposal of labor members that a formula be adopted for the entire six-state region which would set the foundry common labor rate in each labor area 10c. higher than the metal trades common labor rate in that area, and that the resulting increases be extended into the higher classifications to maintain existing differentials.**

**Labor members voted against the new rates in the Springfield-Decatur area, public and industry members forming the majority. Labor also opposed the Racine-Kenosha rates but joined with the public members to provide a majority for their approval when they were unable to gain a greater increase and when industry voted against them.**

**Several policy matters remain unsettled in the WLB attempt to help solve the foundry problems. These were principally whether a formula should be worked out to apply uniformly throughout the region or whether rates should be set or revised on a local labor market basis, whether rates should be set separately for captive and job shops, whether separate rates should be set for steel foundries as distinguished from other ferrous and non-ferrous foundries, and whether increases granted in common labor should be tapered into higher classifications or whether they should be extended uniformly to maintain existing differentials. Industry, labor and public members differ on most of these issues.**

**BEAUTIFUL BUT DEADLY:** ***This spectacular effect is the result of a shot fired by a "bazooka" at Camp Roberts, Cal. One high explosive rocket sends a shower of molten metal into the night and makes a 3 in. hole in tank's armor plate.***



# Carnival Recruiting Attracts Labor To National Tube Co.

***Lorain, Ohio***

• • • **Spearheading a new move to draw more men and women into steelmaking and insure maximum production of critical armament steel, National Tube Co. on Sept. 25 opened a unique labor recruiting center in downtown Lorain.**

**To interest several hundred in taking jobs at the world's largest pipe mill, the company introduced a novel program in a carnival atmosphere.**

**Heralded by a fanfare of trumpets, the recorded voice of a circus barker describes the manpower urgency over a loudspeaker and the attention of passers-by is called to an animated display in a street front window.**

**The crowds see a procession of "great performers" from National Tube plants, including "that battering, blistering baby . . .Mr. Bomb!"; also "a little fellow who doesn't know his own strength . . . Mr. Pressure Cylinder," and many others, all made from steel pipe.**

**Inside is an exhibit of finished products made from Lorain steel, including "Big Inch" pipeline and the deadly fragmentation bomb.**

**A little theater shows battle action films taken by Army Signal Corps and Navy cameramen in the war zones, prepared for war workers. Showings are held several times daily. The film program is changed twice weekly.**

BALDWIN-BUILT
STEERING GEAR

# STANDARD with the L.S.T.

Standard Steel Forgings and Castings have found more than one part to play in World War II. Most recent and critically important are the steering gears on L.S.T.'s now in operation by the U. S. Navy.

Many of the steel forgings and castings in these specially designed quadrant steering gears are products of Standard Steel.

The Baldwin Locomotive Works, Standard Steel Works Division, Burnham, Pa., U.S.A. Offices: Philadelphia, New York, Washington, Boston, Cleveland, Chicago, St. Louis, Houston, San Francisco.

ARMY E NAVY

BLW THE BALDWIN GROUP LST

**BALDWIN**
**STANDARD**
***STEEL FORGINGS & CASTINGS***

# MACHINE TOOLS

*. . . News and Market Activities*

## Sales of Used Machines Confuse Market

*Chicago*

• • • With tooling for war programs virtually completed, emphasis in the current brisk machine tool market is on orders for essential industry and for post war civilian production.

Some deliveries for heavy artillery shell plants remain to be made, but ordering essentially has been completed. The largest single factor in the current market is orders carrying AA-3 preference ratings, destined for such types of essential industry as locomotive builders and engine manufacturers. Prominent in these categories have been Electro-Motive Corp. and Continental Motors.

Orders have not been lacking for post war civilian production. Many of these have been cleared through WPB and placed without preference ratings, under the terms of WPB's four point reconversion program. Effort has been made by WPB, of course, to divert as much of this business as possible to the second-hand market, but special tooling requirements have greatly limited this effort. Present indications are that some large scale production lines may be held up because of delivery delays on one or two key tools, but dealers report that a sympathetic attitude by WPB, when conflict with direct war programs is not involved, may alleviate this difficulty.

The large number of machines which have been placed in mass production in war plants in the past three years now are beginning to contribute a substantial and increasing volume of parts business, dealers report. As long as the volume of war production is maintained, this should be a welcome support for the entire market.

Highlight of used equipment activity is the liquidation by the British Purchasing Commission of plants which were established in this country prior to the entry of this country into the war. Attitude of Chicago used equipment dealers toward these machine tools varies considerably. One firm in particular has made large purchases, while another has steered clear in expectation that when American war production is slashed the tidal wave of tools will make the price structure extremely uncertain. Even though a portion of the tools purchased now could be resold before war plants close in large numbers, the tax situation would greatly limit profit possibilities. Profit would be uncertain on tools which had not been disposed of by that time. Thus, the overall gain on a substantial purchase now would at best be slight, or might vanish entirely and turn to a loss. In this sense, the uncertainty as to when the European war will end hangs over the entire used equipment market, and makes trading extremely cautious.

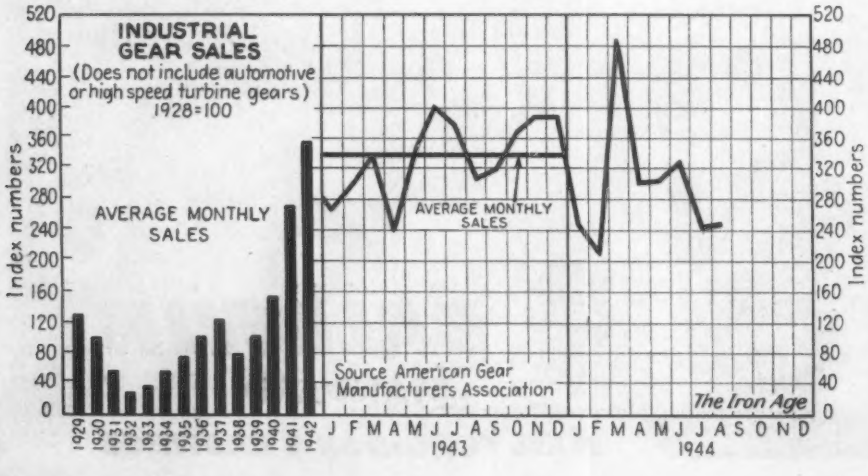
Currently one lot of British owned tools, valued at about $3 million, is being sold. Most of these are fairly new tools, and it is thought will bring about 50 per cent of new price.

The price policy for disposal of government surplus used machine tools issued by the Clayton office in mid-July, and destined to go into effect about a month later, still is a dead letter insofar as the principal agencies are concerned. Many sales to date negotiated by Army Ordnance and the Air Corps have found prices somewhat higher than those envisioned by the Clayton policy. It is acknowledged, however, that even though the cream of these tools may bring higher prices now, eventually difficulty will be encountered in disposing of less desirable tools at the price levels suggested by the Clayton office.

Retooling for civilian production in the Chicago area in some cases is surprisingly far advanced. A general tapering off policy is now clearly discernible, with plants completing current contracts failing to take on new ones, thus gradually liquidating their interest in war production. One civilian goods manufacturer now estimates that he is 95 per cent tooled up for his normal line, and will be ready to go when the signal is given.

### August Gear Sales Increase

**. . . The gearing industry, as represented by the members of the American Gear Manufacturers Association, shows an increase in the volume of sales of 2.1 per cent for August as compared with July. This report does not include turbine or propulsion gearing. The August index figure was 247.**

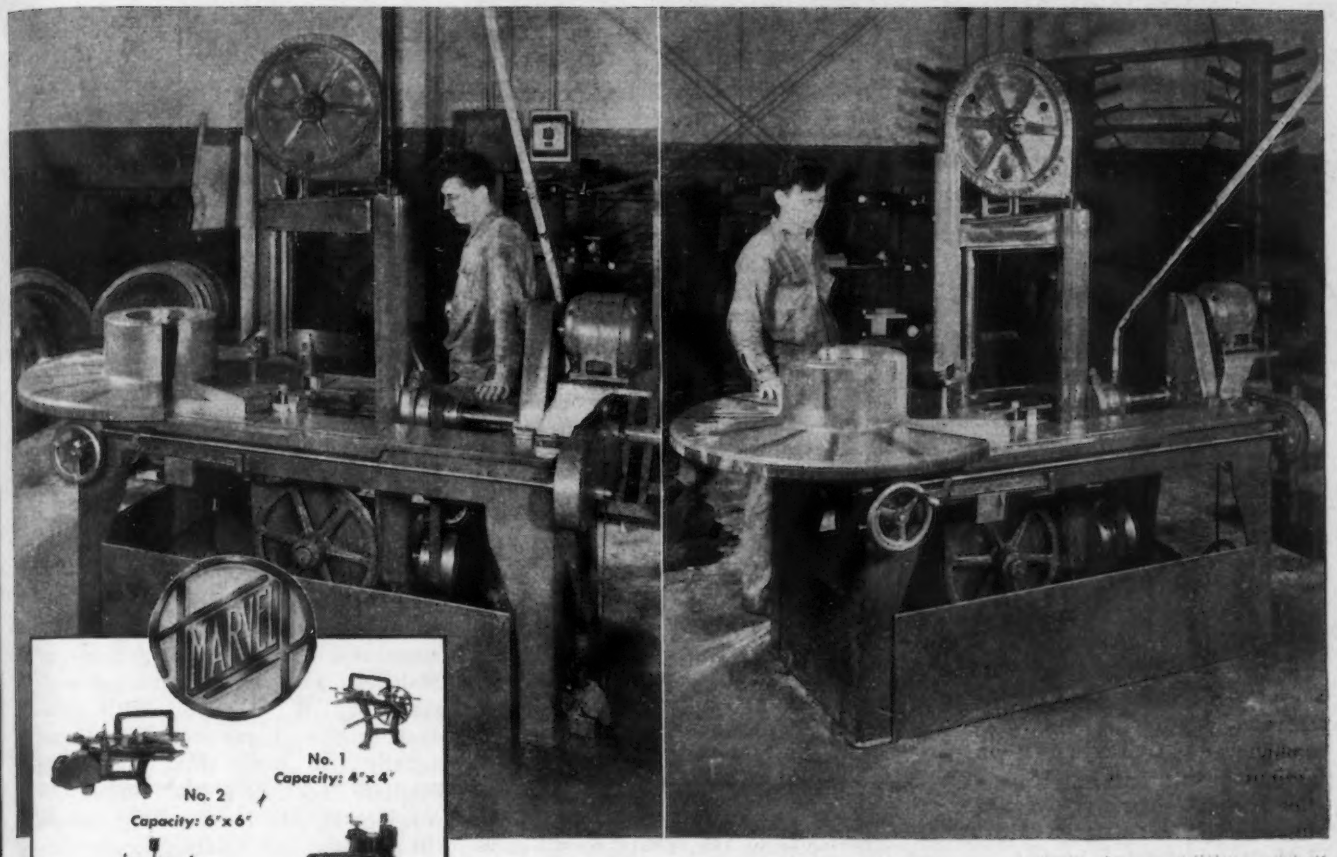


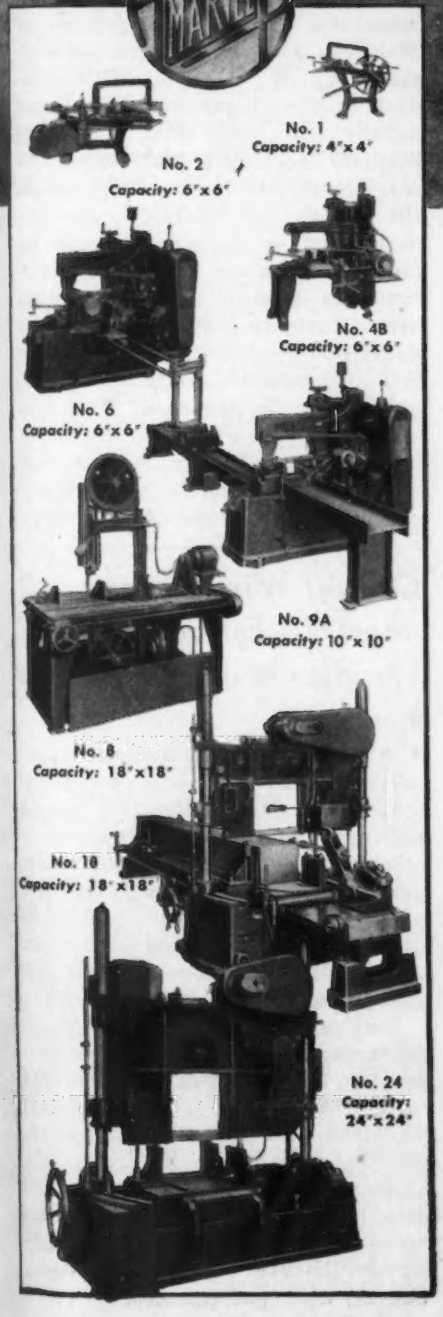

## U. S. Is Principal Buyer Of Surplus Machine Tools

*Washington*

• • • A statement issued on Sept. 26 by Secretary of Commerce Jesse Jones discloses that the government is the principal buyer of surplus machine tools. The statement said that approximately 11,159 used machine tools, costing approximately $58,600,000, had been disposed of, 3535 to private purchasers and 7624 within the government.

DPC sold 789 machine tools to the Chevrolet Division of the General Motors Corp. for $2,379,000, and other transactions were said to be under negotiation. The tools, which were under lease to Chevrolet, averaged 22 months in age and the sales price amounted to approximately 61 per cent of the government's cost.






# The No. 8 MARVEL Band Saw does the "Impossible"

This "impossible" job required the cutting into 12 equal sections of a cast steel ring 42" in diameter. The ring was to be an expanding chuck for stretching and sizing automobile tire rims. Each ring weighed 750 pounds, the length of the cut was 15" and the thickness of the material at the hub was over a foot in thickness. The sectioning of this ring with ordinary equipment was "impossible" because of the high cost involved and the special handling fixtures needed.

The Chicago Gear Mfg. Company, with several MARVEL Saws, including a No. 8 Band Saw, could take this job because they knew that with the Universal MARVEL No. 8 and its broad planer-type bed no special setting-up fixtures or tools would be necessary and that their regular saw operator could service the machine without interfering with his regular work.

The MARVEL No. 8 handles all work up to 18" x 18" cross section and does cutting-off, mitering and notching. The blade feeds into the work at any angle from 45° right to 45° left. It is the most versatile metal-cutting saw built.

## ARMSTRONG-BLUM MFG. CO.

*"The Hack Saw People"*

5700 W. BLOOMINGDALE AVE. CHICAGO 39, U. S. A.

Eastern Sales Office: 225 Lafayette St., New York 12, N. Y.

MARVEL SAWS

# NON-FERROUS METALS

. . . News and Market Activities

## White Metals Scrap Prices Drop Again

• • • **Aluminum scrap prices have dropped sharply again to a range approximately two-thirds as high as OPA ceilings. Specific sales of aluminum scrap have been made at prices as low as $5 and $10 per ton, but these are instances where it has been necessary to clear material out of a plant or where perhaps the cost of long distance transportation brings down the price to the scrap producer in the present buyers' market. The recent statement by a government official that scrap has sold at $1.05 per ton refers to aircraft aluminum alloys considered by remelters to be contaminated with other metals in the alloy which permits recovery of aluminum as low as only 25 per cent of the original scrap weight.**

**There is no market for magnesium scrap and prices nominally are well below half the range of OPA ceilings. Zinc scrap is off another half cent per lb. but with respect to ceilings is much better off than either aluminum or magnesium.**

•

### *Washington*

• • • **Discontinuance of mandatory aluminum scrap segregation in no way implies that the need for segregation has passed, WPB said last week. It was pointed out that although there is a plentiful supply of aluminum, the absorption of scrap will continue to be a problem since 30 per cent of all aluminum used in manufacture becomes scrap whose monthly production exceeds 27,500 tons. Only if segregation by alloy content and by form is continued can the scrap be effectively used.**

**Reports from aluminum producers, smelters, scrap dealers and scrap generators are still required by WPB. Aluminum foundries, wrought products mills and metals powder mills which will now be permitted to purchase scrap, are required to include in report WPB-2685 information as to their purchases.**

•

### *Magnesium*

• • • **OPA has now provided in Amendment 6 to MPR. 314 a specific maximum price for all ASTM magnesium alloys being sold in ingot form. Previously all alloys except four had a ceiling of 23c. per lb. There is said to be a demand now for magnesium alloys that have not been sold before in standard ingot form, and specific maximum prices have been established to meet sellers' complaints that costs required a selling price of more than 23c.**

**The new regulation requires that alloys not listed in the regulation shall be submitted to OPA for price approval. Once approved, however, it becomes the maximum price for all subsequent sales of such alloy ingot by that seller unless subsequently withdrawn by OPA.**

**The action exempts from the pricing provisions of the regulation all sales or deliveries of alloys not listed in the regulation where the amount involved in a single transaction is less than 500 lb. This applies to sales of new magnesium alloys for experimental or laboratory purposes and will relieve industry of the burden of applying for approval of prices for items that will not be sold commercially. Nevertheless, exempted sales must be reported to OPA.**

•

### *Zinc*

• • • **Looking ahead somewhat to today's plentiful supplies of zinc for all war and essential civilian needs and to the coming availability of galvanized steel sheet and shingles, The American Zinc Institute conducted a survey of roofing on farm buildings in 1941 and 1942. The results of the survey have now been compiled and released in a comprehensive study showing age, relative durability, and popularity of roofing by state.**

•

### *Copper*

• • • **Current requirements for primary metal for applications permitted by WPB regulations are being met readily out of authorizations and October allotments to ingot makers have been increased over recent months. Scrap copper supplies are sufficient to meet current demands. OPA scrap groups Nos. 1 and 2, copper and tin containing copper alloys, respectively, are now freely available. Group No. 3, copper alloys containing zinc, is in very poor demand so that in a few instances below ceiling prices are current. Yet scrap producers generally are unwilling to lower asking prices below ceilings in order to improve demand.**

•

### *Tin*

• • • **Supplies of tin are reported adequate to meet current requirements. Some importers and buyers have expressed the opinion that after reconquest of tin-producing areas of Malaysia, the two year period estimated by W. L. Batt, WPB vice-chairman in charge of international supplies, to bring the mines and smelters back into production may be considerably shortened. They reason that should our landing forces converge first on the tin-producing islands of Banka and Billiton, or simultaneously on all mining and smelting areas, it may be possible to take their mines and other works before severe or full destruction could be wreaked on them by the Japanese. It is felt, moreover, that wider application of air transport will permit immediate arrival of reconstruction workers and machinery at the scene of destruction.**

## Copper Wire Orders Must Be Entered With Producers or Warehouses

### *Washington*

• • • **WPB has authorized** copper mill warehouses to enter warehouse stock replacement orders for copper mill wire products with producers or other warehouses provided the orders are to replace, in an equivalent pounds of copper content, copper mill products delivered from warehouse stock under CMP Regulation 4 and not previously ordered from any source.

Each order is to be marked "Warehouse Stock Replacement Order pursuant to the provisions of Direction 4 to CMP Regulation 4," WPB officials explained. Form WPB-3009 delivery reports are no longer required in the absence of other specific instructions from WPB. At the same time, "Warehouse Replacement" authorization letter WPBI-1047 (CMPL-485), dated Oct. 21, 1943, was canceled.

## Primary Metals

*(Cents per lb. unless otherwise noted)*

| | |
|---|---|
| Aluminum, 99+%, del'd. (Min. 10,000 lb.) | 15.00 |
| Antimony, American, Laredo, Tex. | 14.50 |
| Beryllium copper, 3.75-4.25% Be; dollars per lb. contained Be | $17.00 |
| Cadmium, del'd. | 90.00 |
| Cobalt, 97-99% (per lb.) | $1.50 to $1.57 |
| Copper, electro. Conn. valley | 12.00 |
| Copper, electro. New York | 11.75 |
| Copper, lake | 12.00 |
| Gold, U. S. Treas., dollars per oz. | $35.00 |
| Indium, 99.5%, dollars per troy oz. | $7.50 |
| Iridium, dollars per troy oz. | $165.00 |
| Lead, St. Louis | 6.35 |
| Lead, New York | 6.50 |
| Magnesium, 99.9+%, carlots | 20.50 |
| Magnesium, 12-in. sticks, carlots | 27.50 |
| Mercury, dollars per 76-lb. flask, f.o.b. New York | $105 to $106.00 |
| Nickel, electro | 35.00 |
| Palladium, dollars per troy oz. | $24.00 |
| Platinum, dollars per oz. | $35.00 |
| Silver, open market, New York, cents per oz. | 44.75 |
| Tin, Straits, New York | 52.00 |
| Zinc, East St. Louis | 8.25 |
| Zinc, New York | 8.67 |

## Remelted Metals

*(Cents per lb. unless otherwise noted)*

| | |
|---|---|
| Aluminum, No. 12 Fdy. (No. 2) | 10.00 |
| Aluminum, deoxidizing | 7.00 to 10.50 |
| Brass Ingot | |
| 85-5-5-5 (No. 115) | 13.25 |
| 88-10-2 (No. 215) | 16.75 |
| 80-10-10 (No. 305) | 16.00 |
| No. 1 Yellow (No. 405) | 10.25 |

## Copper, Copper Base Alloys

*(Mill base, cents per lb.)*

| | Extruded Shapes | Rods | Sheets |
|---|---|---|---|
| Copper | 20.87 | .... | 20.37 |
| Copper, H.R. | .... | 17.37 | .... |
| Copper drawn | .... | 18.37 | .... |
| Low brass, 80% | .... | 20.40 | 20.15 |
| High brass | .... | .... | 19.48 |
| Red brass, 85% | .... | 20.61 | 20.36 |
| Naval brass | 20.37 | 19.12 | 24.50 |
| Brass, free cut | .... | 15.01 | .... |
| Commercial bronze, 90% | .... | 21.32 | 21.07 |
| Commercial bronze, 95% | .... | 21.53 | 21.28 |
| Manganese bronze | 24.00 | .... | 28.00 |
| Phos. bronze, A, B, 5% | .... | 36.50 | 26.25 |
| Muntz metal | 20.12 | 18.87 | 22.75 |
| Everdur, Herculoy, Olympic or equal | .... | 25.50 | 26.00 |
| Nickel silver, 5% | .... | 28.75 | 26.50 |
| Architect bronze | 19.12 | .... | .... |

## Aluminum

*(Cents per lb., subject to extras on gage, size, temper, finish, factor number, etc.)*

*Tubing:* 2 in. O.D. x 0.065 in. wall 2S, 40c. (½H); 52S, 61c. (O); 24S, 67½c. (T).

*Plate:* 0.250 in. and heavier; 2S and 3S, 21.2c.; 52S, 24.2c.; 61S, 22.8c.; 24S, 24.2c.

*Flat Sheet:* 0.188 in. thickness; 2S and 3S, 22.7c. a lb.; 52S, 26.2c.; 61S, 24.7c.; 24S, 26.7c.

2000-lb. base for tubing; 30,000-lb. base for plate, flat stock.

*Extruded Shapes:* "As extruded" temper; 2000-lb. base, 2S and 3S, factor No. 1 to 4, 25.5c.; 14S, factor No. 1 to 4, 35c.; 17S, factor No. 1 to 4, 31c.; 24S, factor No. 1 to 4, 34c.; 53S, factor No. 1 to 4, 28c.; 61S, factor No. 1 to 4, 28½c.

The factor is determined by dividing perimeter of shape by weight per lineal foot.

*Wire Rod and Bar:* Base price; 17ST and 11ST-3, screw machine stock. Rounds: ¼ in., 28½c. per lb.; ½ in., 26c.; 1 in., 24½c.; 2 in., 23c. Hexagonals; ¼ in., 34½c. per lb.; ½ in., 28½c.; 1 in., 25½c.; 2 in., 25½c. 2S, as fabricated, random or standard lengths, ¼ in., 24c. per lb.; ½ in., 25c.; 1 in., 24c.; 2 in., 23c. 24ST, rectangles and squares, random or standard lengths. 0.093-0.187 in. thick by 1.001-2.000 in. wide, 33c. per lb.; 0.751-1.500 in. thick by 2.001-4.000 in. wide, 29c.; 1.501-2.000 in. thick by 4.001-6.000 in. wide, 27½c.

## Magnesium

Sheet, rod, tubes, bars, extruded shapes subject to individual quotations. Metal turnings: 100 lb. or more, 46c. a lb.; 25 to 90 lb., 56c.; less than 25 lb., 66c.

# NON-FERROUS SCRAP METAL QUOTATIONS

†*(OPA basic maximum prices, cents per lb., f.o.b. point of shipment, subject to quality, quantity and special preparation premiums—other prices are current quotations)*

## Copper, Copper Base Alloys

### *OPA Group 1*†

| | |
|---|---|
| No. 1 wire, No. 1 heavy copper | 9.75 |
| No. 1 tinned copper wire, No. 1 tinned heavy copper | 9.75 |
| No. 2 wire, mixed heavy copper | 8.75 |
| Copper tuyeres | 8.75 |
| Light copper | 7.75 |
| Copper borings | 9.75 |
| No. 2 copper borings | 8.75 |
| Lead covered copper wire, cable | 6.00* |
| Lead covered telephone, power cable | 6.04 |
| Insulated copper | 5.10* |

### *OPA Group 2*†

| | |
|---|---|
| Bell metal | 15.50 |
| High grade bronze gears | 13.25 |
| High grade bronze solids | 11.50* |
| Low lead bronze borings | 11.50* |
| Babbitt lined brass bushings | 13.00 |
| High lead bronze solids | 10.00* |
| High lead bronze borings | 10.00* |
| Red trolley wheels | 10.75 |
| Tinny (phosphor bronze) borings | 10.50 |
| Tinny (Phosphor bronze) solids | 10.50 |
| Copper-nickel solids and borings | 9.25 |
| Bronze paper mill wire cloth | 9.50 |
| Aluminum bronze solids | 9.00 |
| Soft red brass (No. 1 composition) | 9.00 |
| Soft red brass borings (No. 1) | 9.00 |
| Gilding metal turnings | 8.50 |
| Contaminated gilded metal solids | 8.50 |
| Unlined standard red car boxes | 8.25 |
| Lined standard red car boxes | 7.75 |
| Cocks and faucets | 7.75 |
| Mixed brass screens | 7.75 |
| Red brass breakage | 7.50 |
| Old nickel silver solids, borings | 6.25 |
| Copper lead solids, borings | 6.25 |
| Yellow brass castings | 6.25 |
| Automobile radiators | 7.00 |

### *OPA Group 3*†

| | |
|---|---|
| Yellow brass soft sheet clippings | 8.625 |
| Yellow rod brass turnings | 8.375 |
| Zincy bronze borings | 8.00 |
| Zincy bronze solids | 8.00 |
| Fired rifle shells | 8.25 |
| Brass pipe | 7.50 |
| Old rolled brass | 7.00 |
| Admiralty condenser tubes | 7.50 |
| Muntz metal condenser tubes | 7.00 |
| Plated brass sheet, pipe reflectors | 6.50 |
| Manganese bronze solids | 7.25[1] |
| Manganese bronze solids | 6.25[2] |
| Manganese bronze borings | 6.50[1] |
| Manganese bronze borings | 5.50[2] |

### *OPA Group 4*†

| | |
|---|---|
| Refinery brass | 4.75* |

*Price varies with analysis. [1] Lead content 0.00 to 0.40 per cent. [2] Lead content 0.41 to 1.00 per cent.

## Other Copper Alloys†

| | |
|---|---|
| Briquetted Cartridge Brass Turnings | 8.625 |
| Cartridge Brass Turnings, Loose | 7.875 |
| Loose Yellow Brass Trimmings | 7.875 |

## Aluminum

### *Plant scrap, segregated*

| | |
|---|---|
| 2s solids | 7.50 |
| Dural alloys 14, 17, 18, 24, 25S solids | 3.00 |
| turnings, dry basis | 2.00 |
| Low copper alloys 51, 52, 61, 63S solids | 4.75 |
| turnings, dry basis | 2.50 |

### *Plant scrap, mixed*

| | |
|---|---|
| Turnings, dry basis | 1.50 |

### *Obsolete scrap*

| | |
|---|---|
| Pure cable | 7.00 |
| Old sheet and utensils | 4.00 |
| Old castings and forgings | 3.25 |
| Pistons, free of struts | 3.00 |
| Pistons, with struts | 1.50 |
| Old alloy sheet | 3.00 |

## Magnesium

### *Segregated plant scrap*

| | |
|---|---|
| Pure solids and all other solids, exempt Borings and turnings | 1.50 |

### *Mixed, contaminated plant scrap*

| | |
|---|---|
| Grade 1 solids | 3.00 |
| Grade 1 borings and turnings | 2.00 |
| Grade 2 solids | 2.00 |
| Grade 2 borings and turnings | 1.00 |

## Zinc

| | |
|---|---|
| New zinc clippings, trimmings | 6.00 |
| Engravers, lithographers plates | 6.00 |
| Old zinc scrap | 4.75 |
| Unsweated zinc dross | 5.00 |
| Die cast slab | 4.50 |
| New die cast scrap | 4.45 |
| Radiator grilles, old and new | 3.50 |
| Old die cast scrap | 3.00 |

## Lead

Deduct 0.55c. a lb. from refined metal basing point prices or soft and hard lead inc. cable, for f.o.b. point of shipment price.

## Nickel

Ni content 98+%, Cu under ½%, 26c. per lb.; 90 to 98% Ni, 26c. per lb. contained Ni.

# ELECTROPLATING ANODES AND CHEMICALS

### *Anodes*

*(Cents per lb., f.o.b. shipping point)*

| | |
|---|---|
| Copper: Cast, elliptical, 15 in. and longer | 25⅛ |
| Electrolytic, full size | 22⅞ |
| cut to size | 30⅛ |
| Rolled, oval, straight, 15 in. and longer | 23¼ |
| Curved | 24¼ |
| Brass Cast, 82-20, elliptical, 15 in. and longer | 23⅝ |
| Zinc: Cast, 99.99, 16 in. and over | 16¼ |
| Nickel: 99% plus, cast | 47 |
| Rolled, depolarized | 48 |
| Silver: Rolled, 999 fine per Troy (1-9) oz., per oz. | 58 |

### *Chemicals*

*(Cents per lb., delivery from New York)*

| | |
|---|---|
| Copper cyanide, tech., 100-lb. bbls. 1-5 | 5.65 |
| Copper sulphate, 99.5 crystals, bbls. | 13.00-13.50 |
| Nickel salts, single, 425-lb. bbls. | 34.00 |
| Silver cyanide, 100 oz., lots | 40.82-41.125 |
| Sodium cyanide, 96% dom., 100-lb. dms. | 0.15 |
| Zinc cyanide, 100-lb. dms. | 33.00 |
| Zinc, sulphate, 89% crystals, bbls. | 6.80 |

# SCRAP

. . . News and Market Activities

## Scrap Prices Break to New Low

### New York

• • • Steel mills are said to be subject to some criticism because the scrap market has dropped severely, recently. Criticism has been coming from those scrap producers who are industrial fabricators and in many cases are steel companies' customers. They feel, it is said, that a steel price drop should accompany the decline in scrap prices. As to how they can blame the steel industry for the scrap decline is not told. Furthermore, past history indicates that steel prices have been steady over periods of time when there have been substantial fluctuations in scrap prices. Some steel people recall that steel prices do not go up when scrap prices go up.

Meanwhile scrap prices have declined at Pittsburgh, Chicago, Youngstown, Birmingham, Boston, and Cincinnati. The scrap composite has declined from $17.00 a ton to $16.08 as a result of these reductions.

•

*DETROIT*—The market continued dull here this week in the wake of some rather spiritless bidding on a number of auto company lists at the end of September. Bidding in the lists generally centered around most recently quoted prices for the Detroit market. However some divergence of opinion over open hearth grade prices seemed developing among brokers and producers alike, with sales made both above and below the $11.50 to $12 range. In turnings grades producer companies were selling alloy scrap, particularly the 4300 series, well under the $5 price whenever they could find takers. Cast continued very dull.

•

*CHICAGO*—Further weakness in the Chicago market is evidenced in dealer-broker transactions despite lack of mill buying activity. Consumer buying prices quoted therefore are as yet unconfirmed by actual transactions in many cases but reflect the general tone of the market. Greater strength is indicated in the more desirable open hearth grades than in many parts of the country but the weaker open hearth and blast furnace grades and specialty items have been hard hit. Malleable grades are sharply lower with virtually no demand for agricultural malleable on which to base a firm price. There likewise is little activity in cast grades, although quotations still may be computed on the basis of OPA shipping point base plus freight.

•

*PITTSBURGH* — Practically all mills are completely out of the market for scrap at the present time, although some buyers of different classes of turnings will likely be in shortly. Some observers feel that prices are beginning to approach the low level, but this feeling is not universal. Those observers who consider that prices are approaching the bottom point out that the war in Europe is not over by any means. To maintain current high production rates, mills will have to resume purchases of scrap which in turn will firm the prices. However, one of the normally largest consumers took scrap on August orders through September, but has cancelled all undelivered orders as of Oct. 1. This mill indicates that it will work entirely from inventory, at least through October, providing crane capacity is available and no unforeseen stoppages of blast furnace output occur.

•

*PHILADELPHIA* — No orders except from Bethlehem have been placed for October deliveries. Although most consumers are withholding purchases, there has been some expression from mills that perhaps it would be best for prices to decline no farther since, with the approaching cold weather and the labor difficulties, dealers will have little incentive to collect scrap. Although there is some semblance of fear that dealers will allow their already depressed stocks to dwindle still more, mills are diligently working off their inventories. The price of heavy melting steel continues to decline with the most recent purchase made at $14.50 for No. 1. Machine shop turnings are being bought at $10 a gross ton but one purchaser temporarily out of the turnings market intends to come back at a price no higher than $9.50.

•

*NEW YORK*—The market is as inactive as last week's and prices are down an average of 50c. per ton. One broker observes that he is agreeable to take current losses, since an improvement in scrap iron and steel prices at this time would reflect an adverse turn in the war. It is reported that the Army has decided to refrain from returning battlefield scrap to this country for the present at least, because the need for shipping space precludes the delay incident to loading and unloading vessels of scrap.

•

*BUFFALO* — With large consumers still on the sidelines, the market continues soft at prices ranging from $2 to $5 below the OPA ceilings for open hearth and blast furnace grades. The lighter grades show the greatest price weakness, partly in sympathy with Detroit which is exerting pressure on this market. Another 5000 tons arrived by lake from that city last week and at least one shipload is scheduled from Duluth within the fortnight. Unconfirmed reports in trade circles have it that the principal mill interest has put out feelers starting at $16.50 for No. 1 heavy melting and $15.50 for No. 2 down to $12.50 for No. 3 bundles. Most of the business in low phosphorus scrap consists of deliveries on old contracts. Lighter grades of low phos probably would sell at $1 below the ceiling. No. 1 cupola cast is firm, but stove plate and breakable cast show an easier undertone.

•

*CLEVELAND*—All mills in this area continue to remain out of the scrap market, and sales are very few and far between. Foundry buying continues in the foundry grades, but mill buying, the bulk of normal activity, continues non-existent. There is the likelihood that one Cleveland district mill will begin buying shortly after Oct. 1. Likewise, there is little activity in the Valley area in scrap. One mill has been buying substantial quantities of turnings and is likely to go out of the market, while another mill continues to take in some short shoveling turnings and cast iron borings.

•

*CINCINNATI*—Prices in the Southern Ohio District sagged during the present week and even at present quotations, dealers indicate that they are nominal. War news, however, during the past week has tended to create an undercurrent of feeling that there may be some change in the market and that it is a bad move to sell scrap short at the present time. Some items like machine shop turnings are a drug on the market and most consumers tend to back away from the market so that the picture continues to be one of extreme quietness.

•

*BOSTON*—Market for No. 1 steel has settled at $10 a ton, for No. 2 at $9, and for No. 1 busheling at $9. Although sales are small, enough business is reported to establish these prices. Earlier in the week a broker bought 1000 tons of No. 1 shipyard steel, charging size, at $10.27 a ton. Little or no interest is shown in turnings. Supply of chemical borings is smaller than demand and prices appear firm although no sales for October shipment are reported.

•

*BIRMINGHAM*—The scrap market in this area is showing a further weakness and the delivered price on most grades has dropped 50c. per ton. Mills are still out of the market and a week-long strike that closed down open hearths at the Gulfsteel Works of Republic Steel Corp. may delay the return of Republic, the largest scrap consumer in this district.

•

*ST. LOUIS*—The scrap iron market continues weak although prices are unchanged except that heavy turnings are one dollar a ton lower than last week's prices. The flow of scrap to the market is more plentiful. Only two of the district steel mills are buying any supplies and dealers are taking in tonnages to cover on orders taken on the present basis.

**[ Going prices as obtained in the trade by IRON AGE editors, based on representative tonnages (for ceiling prices see O. P. A. schedule No. 4). ]**

## PITTSBURGH

**Per gross ton delivered to consumer:**

| | | |
|---|---|---|
| No. 1 hvy. melt | $16.00 to | $16.50 |
| RR. hvy. melt | 17.00 to | 17.50 |
| No. 2 hvy. melt | 15.50 to | 16.00 |
| RR. scrap rails | .... | 21.50 |
| Rails 3 ft. and under | .... | 23.50 |
| Compre'd sheets, new | 16.00 to | 16.50 |
| Hand bdld. sheets | 15.50 to | 16.00 |
| Hvy. axle turn | 15.25 to | 15.75 |
| Mach. shop turn | 9.00 to | 9.50 |
| Hvy. steel forge turn | 15.25 to | 15.75 |
| Short shov. turn | 12.00 to | 12.50 |
| Mixed bor. and turn. | 9.00 to | 9.50 |
| Hvy. break. cast | 17.50 to | 18.50 |
| Cast iron borings | 11.50 to | 12.00 |
| No. 1 cupola | 21.00 to | 22.00 |
| RR. knuck. and coup. | 22.00 to | 22.50 |
| RR. coil springs | 22.00 to | 22.50 |
| Rail leaf springs | 22.00 to | 22.50 |
| Rolled steel wheels | 22.00 to | 22.50 |
| Low phos. billet crops | 24.00 to | 25.00 |
| Low phos. | 19.50 to | 20.50 |
| RR malleable | .... | 22.00 |

## CHICAGO

**Per gross ton delivered to consumer**

| | | |
|---|---|---|
| No. 1 hvy. melting | $17.25 to | $17.75 |
| No. 2 hvy. melting | 16.25 to | 16.75 |
| No. 1 bundles | 16.25 to | 16.75 |
| No. 2 dealers' bndls. | 15.25 to | 15.75 |
| Bndld. mach. shop turnings | 15.25 to | 15.75 |
| Galv. bundles (No. 3) | 13.25 to | 13.75 |
| Mach. shop turnings | 8.50 to | 9.00 |
| Short shoveling trngs. | 10.00 to | 10.50 |
| Cast iron borings | 9.50 to | 10.00 |
| Mix. bor. & short turn. | 9.25 to | 9.75 |
| Low phos. hvy. forge | 19.50 to | 20.00 |
| Low phos. plates | 17.25 to | 17.75 |
| No. 1 RR hvy. mltng. | .... | 18.75 |
| Reroll rails | .... | 22.25 |
| Cut rails, 3 ft. and under | 21.25 to | 21.75 |
| Locomotive tires, cut | 17.75 to | 18.25 |
| frames | 18.25 to | 18.75 |
| Cut bolsters & side Angles & splice bars | 19.75 to | 20.25 |
| No. 3 steel wheels | 19.50 to | 20.00 |
| Couplers & knuckles | 20.00 to | 20.50 |
| Cut rails, 2 ft. and under | 23.00 to | 23.50 |
| Miscellaneous rails | 19.25 to | 19.75 |
| St'dard stl. car axles | 23.00 to | 23.50 |
| No. 1 mach. cast | 21.34 to | 23.00 |
| No. 1 agricul. cast | 21.34 to | 23.00 |
| Cast iron car wheels | 21.34 to | 23.00 |
| Hvy. breakable cast | 17.34 to | 17.84 |
| RR grate bars | 16.59 to | 18.25 |
| Brake shoes | 16.59 to | 17.09 |
| Stove plate | 20.34 to | 20.84 |
| Clean auto cast | 21.34 to | 23.00 |
| Agricul. malleable | 18.50 to | 19.00 |
| RR. malleable | 19.50 to | 20.00 |

## CLEVELAND

**Per gross ton delivered to consumer:**

| | | |
|---|---|---|
| No. 1 hvy. melting | $16.00 to | $16.50 |
| No. 2 hvy. melting | 16.00 to | 16.50 |
| Compressed sheet stl. | 16.00 to | 16.50 |
| Drop forge flashings | 16.00 to | 16.50 |
| Mach. shop turnings | 7.00 to | 8.00 |
| Short shovel. trngs. | 12.50 to | 13.50 |
| No. 1 busheling | 16.00 to | 16.50 |
| Steel axle turnings | 15.00 to | 16.00 |
| Low phos. billet and bloom crops | 20.00 to | 21.00 |
| Cast iron borings | 12.50 to | 13.50 |
| Mixed bor. & turns. | 10.50 to | 11.50 |
| No. 2 busheling | 14.00 to | 14.50 |
| No. 1 machine cast | 20.00 plus | frt. |
| Railroad cast | 20.00 plus | frt. |
| Railroad grate bars | .. | 15.25 |
| Stove plate | 19.00 plus | frt. |
| Rails 3 ft. & under | .... | 23.00 |
| Rails 18 in. & under | .... | 24.25 |
| Rails for rerolling | .... | 23.50 |
| Railroad malleable | 22.00 plus | frt. |
| Elec. furnace punch. | 19.50 to | 20.50 |

## DETROIT

**Per gross ton, brokers' buying prices:**

| | | |
|---|---|---|
| No. 1 hvy. melting | $11.50 to | $12.00 |
| No. 1 hvy. comp. sh'ts | 11.50 to | 12.00 |
| No. 2 hvy. melting | 11.50 to | 12.00 |
| No. 1 bundles | 11.50 to | 12.00 |
| New busheling | 11.50 to | 12.00 |
| Mach. shop turnings | 5.00 to | 5.50 |
| Short shov. turnings | 6.75 to | 7.25 |
| Cast iron borings | 6.00 to | 6.50 |
| Mixed bor. & turns. | 5.00 to | 5.50 |
| No. 1 cupola cast | 19.00 to | 20.00 |
| Charging box cast | 15.75 to | 16.25 |
| Hvy. breakable cast | 13.25 to | 13.75 |
| Stove plate | 17.00 to | 17.50 |
| Flashings | 11.50 to | 12.00 |
| Low phos. plate | 15.75 to | 16.25 |
| Automotive cast | 19.00 to | 20.00 |

## PHILADELPHIA

**Per gross ton delivered to consumer:**

| | | |
|---|---|---|
| No. 1 hvy. melting | .... | $14.50 |
| No. 2 hvy. melting | .... | 13.50 |
| No. 2 bundles | .... | 12.50 |
| Mach. shop turnings | $10.00 to | 11.00 |
| Shoveling turnings | 12.75 to | 13.00 |
| Cast iron borings | 12.00 to | 12.50 |
| Mixed bor. & turns. | 10.00 to | 11.00 |
| No. 1 cupola cast | 21.34 to | 24.16 |
| Hvy. breakable cast | 15.84 to | 21.50 |
| Cast, charging box | 18.34 to | 19.00 |
| Hvy. axle, forge turn | 16.25 to | 16.75 |
| Low phos. plate | 18.75 to | 19.25 |
| Low phos. punchings | 19.75 to | 20.25 |
| Billet crops | 19.25 to | 19.75 |
| RR. steel wheels | 19.50 to | 20.00 |
| RR. coil springs | 19.50 to | 20.00 |
| RR. malleable | .... | 23.64 |

## ST. LOUIS

**Per gross ton delivered to consumer:**

| | | |
|---|---|---|
| Hvy. melting | .... | $16.50 |
| No. 1 locomotive tires | .... | 16.00 |
| Misc. stand. sec. rails | .... | 17.00 |
| Railroad springs | $17.00 to | 17.50 |
| Bundled sheets | .... | 15.00 |
| Heavy turnings | .... | 10.25 |
| Rerolling rails | .... | 21.00 |
| Steel car axles | .... | 23.50 |
| Steel rails under 3 ft. | .... | 21.50 |
| Steel angle bars | .... | 18.00 |
| Cast iron car wheels | .... | 20.00 |
| No. 1 machinery cast | .... | 20.00 |
| Railroad malleable | .... | 21.00 |
| Breakable cast | .... | 16.50 |
| Stove plate | .... | 17.00 |
| Grate bars | .... | 15.25 |
| Brake shoes | .... | 15.25 |

Note: Cast grades f.o.b. Shipping Point.

## BIRMINGHAM

**Per gross ton delivered to consumer:**

| | | |
|---|---|---|
| No. 1 hvy. melting | $14.50 to | $15.00 |
| No. 2 hvy. melting | 14.50 to | 15.00 |
| No. 2 bundles | 13.50 to | 14.00 |
| No. 1 busheling | 11.50 to | 12.00 |
| Scrap rails | 14.50 to | 15.00 |
| Rails for rerolling | 17.50 to | 18.00 |
| Rails 3 ft. & under | 17.50 to | 18.00 |
| Angle & splice bars | 16.50 to | 17.00 |
| Long turnings | 4.50 to | 5.00 |
| Cast iron borings | 6.50 to | 7.00 |
| Steel axles | 14.50 to | 15.00 |
| Stove plate | 16.50 to | 17.00 |
| Bar crops and plate | 16.00 to | 16.50 |
| Structural and plate | 16.00 to | 16.50 |
| No. 1 cast | 20.00 to | 21.00 |
| Cast iron carwheels | 13.00 to | 13.50 |

## YOUNGSTOWN

**Per gross ton delivered to consumer:**

| | | |
|---|---|---|
| No. 1 hvy. melting | $16.50 to | $17.50 |
| No. 2 hvy. melting | 16.50 to | 17.50 |
| Low phos. plate | 18.50 to | 19.50 |
| No. 1 busheling | 16.50 to | 17.50 |
| Hydraulic bundles | 16.50 to | 17.50 |
| Mach. shop turnings | 7.50 to | 8.50 |
| Short shovel. trngs. | 11.50 to | 12.50 |
| Cast iron borings | 12.00 to | 13.00 |

## NEW YORK

**Dealers' buying prices, per gross ton, on cars:**

| | | |
|---|---|---|
| No. 1 hvy. melting | $11.50 to | $12.00 |
| No. 2 hvy. melting | 10.50 to | 11.00 |
| Hyd. comp. black bundles | 9.50 to | 10.00 |
| Hyd. comp. galv. bundles | 7.50 to | 8.00 |
| Hvy. breakable cast | .... | 16.50 |
| Charging box cast | .... | 17.50 |
| No. 1 cupola cast | .... | 20.00 |
| Clean auto cast | .... | 20.00 |
| Unstrip. motor blks. | .... | 17.50 |
| Stove plate | .... | 19.00 |
| Clean chem. cast bor. | .... | 14.33 |
| Mach. shop turnings | 6.00 to | 6.50 |
| Mixed bor. & turns. | 6.00 to | 6.50 |

## CINCINNATI

**Per gross ton delivered to consumer:**

| | | |
|---|---|---|
| No. 1 hvy. melting | $15.50 to | $16.00 |
| No. 2 hvy. melting | 14.50 to | 15.00 |
| No. 1 bundles | 15.50 to | 16.00 |
| No. 2 bundles | 13.50 to | 14.00 |
| Mach. shop turnings | 6.00 to | 6.50 |
| Shoveling turnings | 7.00 to | 7.50 |
| Cast iron borings | 7.50 to | 8.00 |
| Mixed bor. & turns. | 12.50 to | 13.50 |
| No. 1 cupola cast | .... | 21.00 |
| Hvy. breakable cast | .... | 16.50 |
| Low phos. plate | 21.00 to | 22.00 |
| Scrap rails | .. | 21.00 |
| Stove plate | 16.00 to | 16.50 |

## BUFFALO

**Per gross ton delivered to consumer:**

| | | |
|---|---|---|
| No. 1 hvy. melting | $17.00 to | $18.00 |
| No. 1 bundles | 16.00 to | 16.50 |
| No. 2 bundles | 15.00 to | 15.50 |
| No. 2 hvy. melting | 16.00 to | 16.50 |
| Mach. shop turnings | 9.00 to | 9.50 |
| Shoveling turnings | 11.00 to | 11.50 |
| Cast iron borings | 11.00 to | 11.50 |
| Mixed bor. & turns. | 11.00 to | 11.50 |
| No. 1 cupola cast | 20.50 to | 22.50 |
| Stove plate | 19.50 to | 21.50 |
| Low phos. plate | .... | 21.75 |
| Scrap rails | 19.00 to | 19.25 |
| Rails 3 ft. & under | .... | 22.75 |
| RR steel wheels | .... | 23.75 |
| Cast iron car wheels | .... | 20.90 |
| RR coil & leaf sprgs. | .... | 23.75 |
| RR knuckles & coup. | .... | 23.75 |
| RR malleable | .... | 22.00 |
| No. 1 busheling | 16.00 to | 16.50 |

## BOSTON

**Dealers' buying prices per gross ton, f.o.b. cars**

| | | |
|---|---|---|
| No. 1 hvy. melting | $10.00 to | $10.27 |
| No. 2 hvy. melting | .... | 9.00 |
| Bundled skeleton | .... | 9.00 |
| Turnings, shovelings | .... | 7.00 |
| Turnings, regular | .... | 5.50 |
| Mixed bor. & turns. | 5.00 to | 5.50 |
| Mixed alloy turnings | 4.00 to | 4.50 |
| Clean cast chem. bor. | 13.06 to | 14.15 |
| **Delivered to fdry. per gr. ton** | | |
| Breakable cast | 21.57 to | 21.87 |
| Stove plate | 20.00 to | 23.51 |
| Machinery cast, truck | 21.00 to | 23.51 |

## CALIFORNIA BASING POINTS

**Per gross ton delivered to consumer:**

**San Francisco and Los Angeles**

| | | |
|---|---|---|
| No. 1 hvy. melting | $16.00 to | $16.75 |
| RR hvy. melting | 16.00 to | 16.75 |
| No. 2 hvy. melting | 15.00 to | 15.75 |
| Mach. shop turnings | 4.50 to | 7.00 |
| No. 1 cupola cast | 21.00 to | 25.00 |
| No. 2 bales | 14.00 to | 14.75 |
| No. 3 bales | 10.00 to | 10.75 |
| Electric furnace 1 ft. under | 17.00 to | 19.50 |

**Seattle**

| | | |
|---|---|---|
| No. 1 hvy. melting | .... | $14.50 |
| RR hvy. melting | .... | 14.50 |
| No. 3 bundles | .... | 12.50 |
| No. 1 cupola cast | $21.00 to | 23.00 |
| Electric furnace, 1 ft., under | 16.00 to | 17.00 |

# Comparison of Prices . . .

Advances Over Past Week in **Heavy Type**; Declines in *Italics*. (Prices Are F.O.B. Major Basing Points)

| Flat Rolled Steel: (Cents Per Lb.) | Oct. 3, 1944 | Sept. 26, 1944 | Aug. 29, 1944 | Oct. 5, 1943 |
|---|---|---|---|---|
| Hot rolled sheets | 2.10 | 2.10 | 2.10 | 2.10 |
| Cold rolled sheets | 3.05 | 3.05 | 3.05 | 3.05 |
| Galvanized sheets (24 ga.) | 3.50 | 3.50 | 3.50 | 3.50 |
| Hot rolled strip | 2.10 | 2.10 | 2.10 | 2.10 |
| Cold rolled strip | 2.80 | 2.80 | 2.80 | 2.80 |
| Plates | 2.10 | 2.10 | 2.10 | 2.10 |
| Plates, wrought iron | 3.80 | 3.80 | 3.80 | 3.80 |
| Stain's c.r. strip (No. 302) | 28.00 | 28.00 | 28.00 | 28.00 |
| **Tin and Terne Plate: (Dollars Per Base Box)** | | | | |
| Tin plate, standard cokes | $5.00 | $5.00 | $5.00 | $5.00 |
| Tin plate, electrolytic | 4.50 | 4.50 | 4.50 | 4.50 |
| Special coated mfg. ternes | 4.30 | 4.30 | 4.30 | 4.30 |
| **Bars and Shapes: (Cents Per Lb.)** | | | | |
| Merchant bars | 2.15 | 2.15 | 2.15 | 2.15 |
| Cold finished bars | 2.65 | 2.65 | 2.65 | 2.65 |
| Cold finished bars | 2.65 | 2.65 | 2.65 | 2.65 |
| Alloy bars | 2.70 | 2.70 | 2.70 | 2.70 |
| Structural shapes | 2.10 | 2.10 | 2.10 | 2.10 |
| Stainless bars (No. 302) | 24.00 | 24.00 | 24.00 | 24.00 |
| Wrought iron bars | 4.40 | 4.40 | 4.40 | 4.40 |
| **Wire and Wire Products: (Cents Per Lb.)** | | | | |
| Plain wire | 2.60 | 2.60 | 2.60 | 2.60 |
| Wire nails | 2.55 | 2.55 | 2.55 | 2.55 |
| **Rails: (Dollars Per Gross Ton)** | | | | |
| Heavy rails | $40.00 | $40.00 | $40.00 | $40.00 |
| Light rails | 40.00 | 40.00 | 40.00 | 40.00 |
| **Semi-Finished Steel: (Dollars Per Gross Ton)** | | | | |
| Rerolling billets | $34.00 | $34.00 | $34.00 | $34.00 |
| Sheet bars | 34.00 | 34.00 | 34.00 | 34.00 |
| Slabs, rerolling | 34.00 | 34.00 | 34.00 | 34.00 |
| Forging billets | 40.00 | 40.00 | 40.00 | 40.00 |
| Alloy blooms, billets, slabs | 54.00 | 54.00 | 54.00 | 54.00 |
| **Wire Rods and Skelp: (Cents Per Lb.)** | | | | |
| Wire rods | 2.00 | 2.00 | 2.00 | 2.00 |
| Skelp | 1.90 | 1.90 | 1.90 | 1.90 |

| Pig Iron: (Per Gross Ton) | Oct. 3, 1944 | Sept. 26, 1944 | Aug. 29, 1944 | Oct. 5, 1943 |
|---|---|---|---|---|
| No. 2 fdy., Philadelphia | $25.84 | $25.84 | $25.84 | $25.84 |
| No. 2, Valley furnace | 24.00 | 24.00 | 24.00 | 24.00 |
| No. 2, Southern Cin'ti | 25.11 | 25.11 | 25.11 | 24.68 |
| No. 2, Birmingham | 20.38 | 20.38 | 20.38 | 20.38 |
| No. 2, foundry, Chicago† | 24.00 | 24.00 | 24.00 | 24.00 |
| Basic, del'd eastern Pa. | 25.34 | 25.34 | 25.34 | 25.39 |
| Basic, Valley furnace | 23.50 | 23.50 | 23.50 | 23.50 |
| Malleable, Chicago† | 24.00 | 24.00 | 24.00 | 24.00 |
| Malleable, Valley | 24.00 | 24.00 | 24.00 | 24.00 |
| L. S. charcoal, Chicago | 37.34 | 37.34 | 37.34 | 31.34 |
| Ferromanganese‡ | 135.00 | 135.00 | 135.00 | 135.00 |

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.
‡For carlots at seaboard.

| Scrap: (Per Gross Ton) | Oct. 3, 1944 | Sept. 26, 1944 | Aug. 29, 1944 | Oct. 5, 1943 |
|---|---|---|---|---|
| Heavy melt'g steel, P'gh. | *$16.25* | $17.25 | $19.76 | $20.00 |
| Heavy melt'g steel, Phila. | *14.50* | 15.25 | 18.00 | 18.75 |
| Heavy melt'g steel, Ch'go | *17.50* | 18.50 | 18.75 | 18.75 |
| No. 1 hy. comp. sheet, Det. | 11.75 | 11.75 | 15.25 | 17.85 |
| Low phos. plate, Youngs'n | *19.00* | 19.50 | 20.50 | 22.50 |
| No. 1 cast, Pittsburgh | 21.50 | 20.00* | 20.00 | 20.00 |
| No. 1 cast, Philadelphia | 22.75 | 20.00* | 20.00 | 20.00 |
| No. 1 cast, Chicago | 22.17 | 22.17 | 20.00 | 20.00 |

*F.o.b. shipping point.

| Coke, Connellsville: (Per Net Ton at Oven) | Oct. 3, 1944 | Sept. 26, 1944 | Aug. 29, 1944 | Oct. 5, 1943 |
|---|---|---|---|---|
| Furnace coke, prompt | $7.00 | $7.00 | $7.00 | $6.50 |
| Foundry coke, prompt | 8.25 | 8.25 | 8.25 | 7.50 |

| Non-Ferrous Metals: (Cents per Lb. to Large Buyers) | Oct. 3, 1944 | Sept. 26, 1944 | Aug. 29, 1944 | Oct. 5, 1943 |
|---|---|---|---|---|
| Copper, electro., Conn. | 12.00 | 12.00 | 12.00 | 12.00 |
| Copper, Lake | 12.00 | 12.00 | 12.00 | 12.00 |
| Tin (Straits), New York | 52.00 | 52.00 | 52.00 | 52.00 |
| Zinc, East St. Louis | 8.25 | 8.25 | 8.25 | 8.25 |
| Lead, St. Louis | 6.35 | 6.35 | 6.35 | 6.35 |
| Aluminum, Virgin, del'd. | 15.00 | 15.00 | 15.00 | 15.00 |
| Nickel, electrolytic | 35.00 | 35.00 | 35.00 | 35.00 |
| Magnesium, ingot | 20.50 | 20.50 | 20.50 | 20.50 |
| Antimony, Laredo, Tex. | 14.50 | 14.50 | 14.50 | 14.50 |

The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 156-165.

# Composite Prices . . .

Starting with the issue of April 22, 1943, the weighted finished steel price index was revised for the years 1941, 1942 and 1943. See explanation of the change on page 90 of the April 22, 1943, issue.

| | FINISHED STEEL | PIG IRON | SCRAP STEEL |
|---|---|---|---|
| October 3, 1944 | 2.25513c. a Lb. | 23.61 a Gross Ton | *$16.08* a Gross Ton |
| One week ago | 2.25513c. a Lb. | 23.61 a Gross Ton | $17.00 a Gross Ton |
| One month ago | 2.25513c. a Lb. | 23.61 a Gross Ton | $18.84 a Gross Ton |
| One year ago | 2.26190c. a Lb. | 23.61 a Gross Ton | $19.17 a Gross Ton |

| | FINISHED STEEL HIGH | FINISHED STEEL LOW | PIG IRON HIGH | PIG IRON LOW | SCRAP STEEL LOW | SCRAP STEEL HIGH |
|---|---|---|---|---|---|---|
| 1943 | 2.25513c., | 2.25513c., | $23.61 | $23.61 | $19.17 | $19.17 |
| 1942 | 2.26190c., | 2.26190c., | 23.61 | 23.61 | 19.17 | 19.17 |
| 1941 | 2.43078c., | 2.43078c., | $23.61, Mar. 20 | $23.45, Jan. 2 | $19.17, Apr. 10 | $22.00, Jan. 7 |
| 1940 | 2.30467c., Jan. 2 | 2.24107c., Apr. 16 | 23.45, Dec. 23 | 22.61, Jan. 2 | 16.04, Apr. 9 | 21.83, Dec. 30 |
| 1939 | 2.35367c., Jan. 3 | 2.26689c., May 16 | 22.61, Sept. 19 | 20.61, Sept. 12 | 14.08, May 16 | 22.50, Oct. 3 |
| 1938 | 2.58414c., Jan. 4 | 2.27207c., Oct. 18 | 23.25, June 21 | 19.61, July 6 | 11.00, June 7 | 15.00, Nov. 22 |
| 1937 | 2.58414c., Mar. 9 | 2.32263c., Jan. 4 | 23.25, Mar. 9 | 20.25, Feb. 16 | 12.67, June 8 | 21.92, Mar. 30 |
| 1936 | 2.32263c., Dec. 28 | 2.05200c., Mar. 10 | 19.74, Nov. 24 | 18.73, Aug. 11 | 12.67, June 9 | 17.75, Dec. 21 |
| 1935 | 2.07642c., Oct. 1 | 2.06492c., Jan. 8 | 18.84, Nov. 5 | 17.83, May 14 | 10.33, Apr. 29 | 13.42, Dec. 10 |
| 1934 | 2.15367c., Apr. 24 | 1.95757c., Jan. 2 | 17.90, May 1 | 16.90, Jan. 27 | 9.50, Sept. 25 | 13.00, Mar. 13 |
| 1933 | 1.95578c., Oct. 3 | 1.75836c., May 2 | 16.90, Dec. 5 | 13.56, Jan. 3 | 6.75, Jan. 3 | 12.25, Aug. 8 |
| 1932 | 1.89196c., July 5 | 1.83901c., Mar. 1 | 14.81, Jan. 5 | 13.56, Dec. 6 | 6.43, July 5 | 8.50, Jan. 12 |
| 1931 | 1.99626c., Jan. 13 | 1.86586c., Dec. 29 | 15.90, Jan. 6 | 14.79, Dec. 15 | 8.50, Dec. 29 | 11.33, Jan. 6 |
| 1930 | 2.25488c., Jan. 7 | 1.97319c., Dec. 9 | 18.21, Jan. 7 | 15.90, Dec. 16 | 11.25, Dec. 9 | 15.00, Feb. 18 |
| 1929 | 2.31773c., May 28 | 2.26498c., Oct. 29 | 18.71, May 14 | 18.21, Dec. 17 | 14.08, Dec. 3 | 17.58, Jan. 29 |

Weighted index based on steel bars, beams, tank plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 per cent of the United States output. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

## Bright BRASS is a time-honored Badge of the good housekeeper

SINCE time beyond recall, the cheerful gleam of Brass has been one of the bright spots of home-making. In the shining welcome of the knocker and knob on the door . . . in the glow of burnished lamps . . . in the sparkle of andirons and fire-tools on the hearth...in all these and more, Brass has a way of saying: "Sit back and enjoy yourself, friend! This is a hospitable, self-respecting household."

Likewise, to many fabricators of home furnishings and hardware, the name of Bristol for 94 years has said: "You can always bank on Bristol Brass for easily workable, non-corrodible alloys that conform exactly to your specifications . . . shipment after shipment . . . year after year." And, come the day when Allied guns cease firing, Bristol Brass will be available again for all the domestic and industrial uses which no other metal or material has ever been able to fulfill with such complete satisfaction *both* to manufacturer and consumer.

*THE*

**BRISTOL BRASS**

**CORPORATION**

*Makers of Brass since 1850, Bristol, Conn.*

★ BUY BONDS TO BUY BRASS FOR BULLETS ★

# Finished Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points, in cents per lb., unless otherwise indicated. Extras apply. Delivered prices do not reflect 3% tax on freight. (1) Mill run sheet, 10c. per lb. under base; primes 25c. above base. (2) Unassorted 8-lb. coating. (3) Widths up to 12-in. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producer to consumer. Discount of 25c. per 100 lb to fabricators. (8) Also shafting. For quantities of 20,000 to 29,999 lb. (9) Carload lot in manufacturing trade. (10) Prices do not apply if rail and water is not used. (12) Boxed. (13) Portland and Seattle price, San Francisco 2.50c. (14) This base price for annealed, bright finish wires, commercial spring wire.

| Basing Point → / Product ↓ | Pittsburgh | Chicago | Gary | Cleveland | Birmingham | Buffalo | Youngstown | Sparrows Point | Granite City | Middletown, Ohio | Gulf Ports, Cars | Provo, Utah | Pacific Ports, Cars[10] | DELIVERED TO Detroit | New York | Philadelphia |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hot Rolled Sheets | 2.10¢ | 2.10¢ | 2.10¢ | 2.10¢ | 2.10¢ | 2.10¢ | 2.10¢ | 2.10¢ | 2.20¢ | 2.10¢ | | | 2.65¢ | 2.20¢ | 2.34¢ | 2.27¢ |
| Cold Rolled Sheets[1] | 3.05¢ | 3.05¢ | 3.05¢ | 3.05¢ | | 3.05¢ | 3.05¢ | | 3.15¢ | 3.05¢ | | | 3.70¢ | 3.15¢ | 3.39¢ | 3.37¢ |
| Galv. Sheets (24 gage) | 3.50¢ | 3.50¢ | 3.50¢ | | 3.50¢ | 3.50¢ | 3.50¢ | 3.50¢ | 3.60¢ | 3.50¢ | | | 4.05¢ | | 3.74¢ | 3.67¢ |
| Enameling Sheets (20 gage) | 3.35¢ | 3.35¢ | 3.35¢ | 3.35¢ | | | 3.35¢ | | 3.45¢ | 3.35¢ | | | 4.00¢ | 3.45¢ | 3.71¢ | 3.67¢ |
| Long Ternes[2] | 3.80¢ | 3.80¢ | 3.80¢ | | | | | | | | | | 4.55¢ | | 4.16¢ | 4.12¢ |
| Hot Rolled Strip[3] | 2.10¢ | 2.10¢ | 2.10¢ | 2.10¢ | 2.10¢ | | 2.10¢ | | | 2.10¢ | | | 2.75¢ | 2.20¢ | 2.46¢ | |
| Cold Rolled Strip[4] | 2.80¢ | 2.90¢ | | 2.80¢ | | | 2.80¢ | (Worcester=3.00¢) | | | | | | 2.90¢ | 3.16¢ | |
| Cooperage Stock Strip | 2.20¢ | 2.20¢ | | | 2.20¢ | | 2.20¢ | | | | | | | | 2.56¢ | |
| Commodity C-R Strip | 2.95¢ | 3.05¢ | | 2.95¢ | | | 2.95¢ | (Worcester=3.35¢) | | | | | | 3.05¢ | 3.31¢ | |
| Coke Tin Plate, Base Box | $5.00 | $5.00 | $5.00 | | | | | | $5.10 | | | | | | 5.36¢ | 5.32¢ |
| .50 Electro Tin Plate, Box | $4.50 | $4.50 | $4.50 | | | | | | $4.60 | | | | | | | |
| .75 Electro Tin Plate, Box | $4.65 | | $4.65 | | | | | | $4.75 | | | | | | | |
| Black Plate (29 gage)[8] | 3.05¢ | 3.05¢ | 3.05¢ | | | | | | 3.15¢ | | | | 4.05¢[13] | | | 3.37¢ |
| Mfg. Ternes, Special Box | $4.30 | $4.30 | $4.30 | | | | | | $4.40 | | | | | | | |
| Carbon Steel Bars | 2.15¢ | 2.15¢ | 2.15¢ | 2.15¢ | 2.15¢ | 2.15¢ | | (Duluth=2.25¢) | | | 2.50¢ | | 2.80¢ | 2.25¢ | 2.49¢ | 2.47¢ |
| Rail Steel Bars[6] | 2.15¢ | 2.15¢ | 2.15¢ | 2.15¢ | 2.15¢ | 2.15¢ | | | | | 2.50¢ | | 2.80¢ | | | |
| Reinforcing (Billet) Bars[7] | 2.15¢ | 2.15¢ | 2.15¢ | 2.15¢ | 2.15¢ | 2.15¢ | 2.15¢ | 2.15¢ | | | 2.50¢ | | 2.55¢[13] | 2.25¢ | 2.39¢ | |
| Reinforcing (Rail) Bars[7] | 2.15¢ | 2.15¢ | 2.15¢ | 2.15¢ | 2.15¢ | 2.15¢ | 2.15¢ | | | | 2.50¢ | | c2.55¢[13] | 2.25¢ | | 2.47¢ |
| Cold Finished Bars[8] | 2.65¢ | 2.65¢ | 2.65¢ | 2.65¢ | | 2.65¢ | | (Detroit=2.70¢) | | | | (Toledo=2.80¢) | | | 2.99¢ | 2.97¢ |
| Alloy Bars, Hot Rolled | 2.70¢ | 2.70¢ | | | | 2.70¢ | (Bethlehem, Massillon, Canton=2.70¢) | | | | | | | 2.80¢ | | |
| Alloy Bars, Cold Drawn | 3.35¢ | 3.35¢ | 3.35¢ | 3.35¢ | | 3.35¢ | | | | | | | | 3.45¢ | | |
| Carbon Steel Plates | 2.10¢ | 2.10¢ | 2.10¢ | 2.10¢ | 2.10¢ | | 2.10¢ | (Coatesville and Claymont=2.10¢) 2.10¢ | 2.35¢ | | 2.45¢ | 2.60¢ | 2.65¢ | 2.32¢ | 2.29¢ | 2.15¢ |
| Floor Plates | 3.35¢ | 3.35¢ | | | | | | | | | 3.70¢ | | 4.00¢ | | 3.71¢ | 3.67¢ |
| Alloy Plates | 3.50¢ | 3.50¢ | | | (Coatesville=3.50¢) | | | | | | 3.95¢ | | 4.15¢ | | 3.70¢ | 3.59¢ |
| Structural Shapes | 2.10¢ | 2.10¢ | 2.10¢ | | 2.10¢ | 2.10¢ | (Bethlehem=2.10¢) | | | | 2.45¢ | | 2.75¢ | | 2.27¢ | 2.215¢ |
| SPRING STEEL, C-R 0.26 to 0.50 Carbon | 2.80¢ | | | 2.80¢ | | | (Worcester=3.00¢) | | | | | | | | | |
| 0.51 to 0.75 Carbon | 4.30¢ | | | 4.30¢ | | | (Worcester=4.50¢) | | | | | | | | | |
| 0.76 to 1.00 Carbon | 6.15¢ | | | 6.15¢ | | | (Worcester=6.35¢) | | | | | | | | | |
| 1.01 to 1.25 Carbon | 8.35¢ | | | 8.35¢ | | | (Worcester=8.55¢) | | | | | | | | | |
| Bright Wire[14] | 2.60¢ | 2.60¢ | | 2.60¢ | 2.60¢ | | (Worcester=2.70¢) | | (Duluth=2.65¢) | | | | 3.10¢ | | | 2.92¢ |
| Galvanized Wire | Add proper size extra and galvanizing extra to Bright Wire base | | | | | | | | | | | | | | | |
| Spring (High Carbon) | 3.20¢ | 3.20¢ | | 3.20¢ | | | (Worcester=3.30¢) | | | | | | 3.70¢ | | | 3.52¢ |
| Steel Sheet Piling | 2.40¢ | 2.40¢ | | | | 2.40¢ | | | | | | | 2.95¢ | | | 2.72¢ |

**EXCEPTIONS TO PRICE SCHED. NO. 6**

**Slabs**—Andrews Steel Co. $41 basing pts.; Wheeling Steel Corp. (rerolling) 4 in. sq. or larger $37.75 f.o.b. Portsmouth, Ohio; Empire Sheet & Tin Plate Corp. $41; Phoenix Iron Co. (rerolling) $41, (forging) $47; Granite City Steel $47.50.

**Blooms**—Phoenix Iron Co. (rerolling) $41, (forging) $47; Pgh. Steel Co. (reroll) $38.25, (forging) $44.25. Wheeling Steel Corp. (rerolling) 4 in. sq. or larger $37.75 f.o.b. Portsmouth.

**Sheet Bar**—Empire Sheet & Tin Plate Co. $39 mill; Wheeling Steel Corp. $38 Portsmouth, Ohio.

**Billets, Forging**—Andrews Steel Co. $50 basing pts.; Follansbee Steel Corp. $49.50 Toronto; Phoenix Iron Co. $47.00 mill. Geneva Steel Co. $64.64 f.o.b. Pacific Coast; Pittsburgh Steel Co. $49.50.

**Billets, Rerolling**—Continental Steel Corp. may charge Acme Steel in Chicago switching area $34 plus freight from Kokomo, Ind.; Northwestern Steel & Wire Co. (Lend-Lease) $41 mill; Wheeling Steel Corp., 4 in. sq. or larger $37.75, smaller $39.50 f.o.b. Portsmouth, Ohio; Stanley Works may sell Washburn Wire Co. under allocation at $39 Bridgeport, Conn.; Keystone Steel & Wire Co. may sell Acme Steel Co. at Chicago base, f.o.b. Peoria; Phoenix Iron Co. $41 mill; Continental Steel Corp. (1¾ x 1¾) $39.50, (2 x 2) $40.60 Kokomo, Ind. (these prices include $1 size extra); Keystone Steel & Wire Co. $36.40 Peoria; Connors Steel Co. $50.69 Birmingham; Ford Motor Co. $34 Dearborn, Mich. Geneva Steel Co. $58.64 f.o.b. Pac. C. Pgh. Steel Co. $43.50.

**Structural Shapes**—Phoenix Iron Co. $2.35 basing pts. (export) $2.50 Phoenixville; Knoxville Iron Co. $2.30 basing points.

**Rails**—Sweet Steel Co. (rail steel) $50 mill; West Virginia Rail Co. (lightweight) on allocation based Huntington, W. Va.; Colorado Fuel & Iron Corp., $45 Pueblo.

**Hot Rolled Plate**—Granite City Steel Co. $2.65 mill; Knoxville Iron Co. $2.25 basing pts.; Kaiser Co. and Geneva Steel Co. $3.20 Pacific Ports; Central Iron & Steel Co. $2.50 basing points; Granite City Steel Co. $2.35 Granite City.

**Merchant Bars**—W. Ames Co., 10 tons and over, $2.85 mill; Eckels-Nye Steel Corp., $2.50 basing pts. (rail steel) $2.40; Phoenix Iron Co. $2.40 basing pts.; Sweet Steel Co. (rail steel) $2.35 mill; Joslyn Mfg. & Supply Co., $2.35 Chicago; Calumet Steel Div., Borg Warner Corp. (8 in. mill bars) $2.35 Chicago; Knoxville Iron Co. $2.30 basing pts. Laclede Steel Co., sales to LaSalle Steel granted Chicago base, f.o.b. Madison, Ill. Milton Mfg. Co. $2.75 f.o.b. Milton, Pa.

**Pipe Skelp**—Wheeling Steel Corp., Benwood, $2.05 per cwt.

**Reinforcing Bars**—W. Ames & Co., 10 tons and over, $2.85 mill; Sweet Steel Co. (rail steel) $2.35 mill; Columbia Steel Co. $2.50 Pacific Ports.

**Cold Finished Bars**—Keystone Drawn Steel Co. on allocation. Pittsburgh c.f. base plus c/l freight on hot rolled bars Pittsburgh to Spring City, Pa.; New England Drawn Steel Co. on allocation outside New England, Buffalo c.f. base plus c/l freight Buffalo to Massfield, Mass., f.o.b. Massfield; Empire Finished Steel Corp. on allocation outside New England, Buffalo c.f. base plus c/l freight Buffalo to plants f.o.b. plant; Compressed Steel Shafting Co. on allocation outside New England, Buffalo base plus c/l freight Buffalo to Readville, Mass. f.o.b. Readville; Medart Co. in certain areas, Chicago c.f. base plus c/l freight Chicago to St. Louis, f.o.b. St. Louis.

**Alloy Bars**—Texas Steel Co. for delivery except Texas and Okla. Chicago, base, f.o.b. Fort Worth, Tex.; Connors Steel Co. shipped outside Ala., Mississippi, Louisiana, Georgia, Florida, Tenn., Pittsburgh base, f.o.b. Birmingham.

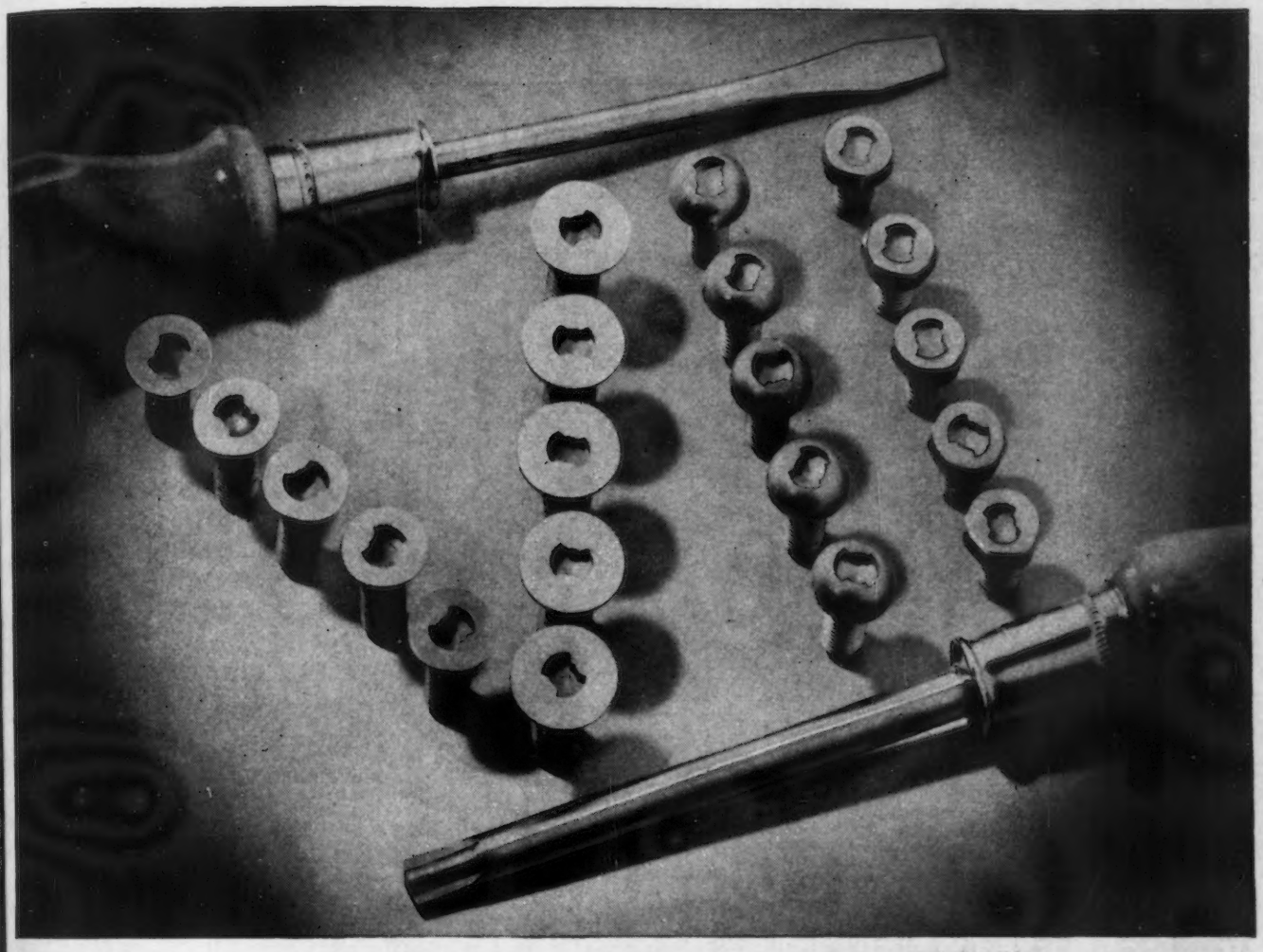
**Hot Rolled Strip**—Joslyn Mfg. & Supply Co. $2.30 Chicago; Knoxville Iron Co. $2.25 basing pts.

**Hot Rolled Sheets**—Andrews Steel Co., Middletown base on shipments to Detroit or area; Parkersburg Iron & Steel Co., $2.25 Parkersburg.

**Galvanized Sheets**—Andrews Steel Co., $3.75 basing pts.; Parkersburg Iron & Steel Co. $3.85 Parkersburg; Apollo Steel Co. $3.75 basing pts.; Continental Steel Co., Middletown base on Kokomo, Ind., product; Superior Sheet Steel Co., Pittsburgh base except for Lend-Lease.

**Pipe and Tubing**—South Chester Tube Co. when priced at Pittsburgh, freight to Gulf Coast and Pacific Ports may be charged from Chester, Pa., also to points lying west of Harrisburg, Pa.

**Black Sheets**—Empire Sheet and Tinplate Co., maximum base price mill is $2.45 per 100 lb., with differentials, transportation charges, etc., provided in RPS. No. 6.



## *Seven Major Features*

have established CLUTCH HEAD as the most modern screw on the market . . . for safer, speedier production and lower final cost.

**I** The wide roomy Clutch, an easy-to-hit target, inviting operator confidence and speed.

**II** Center Pivot entry to prevent canting; deep positive engagement for protection against slippage . . . safeguarding manpower and materials.

**III** No end pressure. The straight-walled Clutch matched by straight-sided driver disposes of "ride-out" tendency as set up by "tapered" drive home.

**IV** CLUTCH HEAD'S exclusive Lock-On unites screw and bit as a unit . . . substituting easy one-handed reaching for fumbling with mechanical fingers.

**V** The rugged Type "A" Bit delivers a longer uninterrupted spell of service . . . and may be repeatedly reconditioned to original efficiency by a 60-second application of the end surface to a grinding wheel.

**VI** Simplified field service . . . because CLUTCH HEAD is the only modern screw operative with the ordinary type screwdriver, *or any flat blade*, of proper width.

**VII** Here again the CLUTCH HEAD Lock-On saves the day. With the Type "A" Bit, rusted-in and frozen-in screws may be withdrawn undamaged and held secure against dropping for re-use.

*Because* CLUTCH HEAD *is "The Screw That Sells Itself," we invite you to personally examine and test these features. Your request will bring you, BY MAIL, a package assortment of* CLUTCH HEAD *Screws and sample Type "A" Bit; also fully illustrated Brochure.*

CLUTCH HEAD SCREWS

**UNITED SCREW AND BOLT CORPORATION**

CHICAGO 8 CLEVELAND 2 NEW YORK 7

## WAREHOUSE PRICES

*Delivered metropolitan areas per 100 lb. These are zoned warehouse prices in conformance with latest zoning amendment to OPA Price Schedule 49.*

| Cities | SHEETS | | | STRIP | | Plates ¼ in. and heavier | Structural Shapes | BARS | | ALLOY BARS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hot Rolled (10 gage) | Cold Rolled | Galvanized (24 gage) | Hot Rolled | Cold Rolled | | | Hot Rolled | Cold Finished | Hot Rolled, NE 8617-20 | Hot Rolled, NE 9442-45 Ann. | Cold Drawn, NE 8617-20 | Cold Drawn, NE 9442-45 Ann. |
| **Philadelphia | 3.518 | 4.872[g] | 5.018[g] | 3.922 | 4.772 | 3.605 | 3.666 | 3.822 | 4.072 | 5.966 | 7.066 | 7.272 | 8.322 |
| New York | 3.590 | 4.613[3] | 5.010 | 3.974[6] | 4.772 | 3.768 | 3.758 | 3.853 | 4.103 | 6.008 | 7.108 | 7.303 | 8.353 |
| Boston | 3.744 | 4.744[9] | 5.224[9] | 4.106 | 4.715 | 3.912 | 3.912 | 4.044 | 4.144 | 6.162 | 7.262 | 7.344 | 8.394 |
| Baltimore | 3.394 | 4.852 | 4.894 | 3.902 | 4.752 | 3.594 | 3.759 | 3.802 | 4.052 | .... | .... | .... | .... |
| Norfolk | 3.771 | 4.965 | 5.371 | 4.165 | 4.865 | 3.971 | 4.002 | 4.065 | 4.165 | .... | .... | .... | .... |
| Chicago | 3.25 | 4.20 | 5.231 | 3.60 | 4.65[17] | 3.55 | 3.55 | 3.50 | 3.75 | 5.75 | 6.85 | 6.85 | 7.90 |
| Milwaukee | 3.387 | 4.337[3] | 5.272[4] | 3.737 | 4.787[17] | 3.687 | 3.687 | 3.637 | 3.887 | 5.987 | 7.087 | 7.087 | 8.137 |
| Cleveland | 3.35 | 4.40 | 4.877[4] | 3.60 | 4.45 | 3.40 | 3.588 | 3.35 | 3.75 | 5.956 | 7.056 | 6.85 | 7.90 |
| Buffalo | 3.35 | 4.40 | 4.75[4] | 3.819 | 4.669 | 3.63 | 3.40 | 3.35 | 3.75 | 5.75 | 6.85 | 6.85 | 7.90 |
| Detroit | 3.45 | 4.50 | 5.00[4] | 3.70 | 4.65[917] | 3.609 | 3.661 | 3.45 | 3.80 | 6.08 | 7.18 | 7.159 | 8.209 |
| Cincinnati | 3.425 | 4.475[3] | 4.825[5] | 3.675 | 4.711 | 3.611 | 3.691 | 3.611 | 4.011 | .... | .... | .... | .... |
| St. Louis | 3.397 | 4.347[3] | 5.172[4] | 3.747 | 4.93[1117] | 3.697 | 3.697 | 3.647 | 4.031 | 6.131 | 7.231 | 7.231 | 8.281 |
| Pittsburgh | 3.35 | 4.40 | 4.75 | 3.60 | 4.45 | 3.40 | 3.40 | 3.35 | 3.75 | 5.75 | 6.85 | 6.85 | 7.90 |
| St. Paul | 3.51 | 4.48 | 5.257[4] | 3.86 | 4.35[17] | 3.813[3] | 3.813[3] | 3.763[3] | 4.361 | 6.09 | 7.19 | 7.561 | 8.711 |
| Omaha | 3.865 | 5.443 | 5.608[4] | 4.215 | .... | 4.165 | 4.165 | 4.115 | 4.43 | .... | .... | .... | .... |
| Indianapolis | 3.58 | 3.58 | 4.568 | 4.918 | 3.768 | 4.78 | 3.63 | 3.58 | 3.98 | 8.08 | 7.18 | 7.18 | 8.23 |
| Birmingham | 3.45 | .... | 4.75 | 3.70 | .... | 3.55 | 3.55 | 3.50 | 4.43 | .... | .... | .... | .... |
| Memphis | 3.965[7] | 4.66 | 3.265 | 4.215 | .... | 4.065 | 4.065 | 4.015 | 4.33 | .... | .... | .... | .... |
| New Orleans | 4.058[*] | 4.95 | 5.358 | 4.308 | .... | 4.158 | 4.158[*] | 4.108[*] | 4.629 | .... | .... | .... | .... |
| Houston | 3.763 | 5.573 | 6.313[1] | 4.313 | .... | 4.25 | 4.25 | 3.75 | 6.373[3] | 7.223 | 8.323 | 8.323 | 9.373 |
| Los Angeles | 5.00 | 7.20[3] | 6.10[4] | 4.95 | 5.613[15] | 4.95 | 4.65 | 4.40 | 5.583 | 8.304 | 9.404 | 9.404 | 10.454 |
| San Francisco | 4.55[14] | 7.30[4] | 6.35[4] | 4.50[14] | 7.333[17] | 4.65[14] | 4.35[14] | 4.15[14] | 5.333 | 8.304 | 9.404 | 9.404 | 10.454 |
| Seattle | 4.65[12] | 7.05[4] | 5.95[4] | 4.25[12] | .... | 4.75[12] | 4.45[12] | 4.35[12] | 5.783 | .... | 9.404 | .... | .... |
| Portland | 4.65[11] | 6.60[4] | 5.75[4] | 4.75[11] | .... | 4.75[11] | 4.45[11] | 4.45[11] | 5.533 | 8.304 | 9.404 | 8.304 | 9.404 |
| Salt Lake City | 4.53[17] | .... | 6.17[18] | 5.53[17] | .... | 4.98[17] | 4.98[17] | 4.88[17] | 5.90 | .... | .... | .... | .... |

## MILL EXTRAS FOR NATIONAL EMERGENCY STEELS

| Designation | Basic Open-Hearth | | Electric Furnace | | Designation | Basic Open-Hearth | | Electric Furnace | |
|---|---|---|---|---|---|---|---|---|---|
| | Bars and Bar-Strip | Billets, Blooms, and Slabs | Bars and Bar-Strip | Billets, Blooms, and Slabs | | Bars and Bar-Strip | Billets, Blooms, and Slabs | Bars and Bar-Strip | Billets, Blooms, and Slabs |
| NE 1330 | 0.10¢ | $2.00 | .... | ..... | NE 9415 | 0.75¢ | $15.00 | $1.25 | $25.00 |
| NE 1335 | 0.10 | 2.00 | .... | ..... | NE 9417 | 0.75 | 15.00 | 1.25 | 25.00 |
| NE 1340 | 0.10 | 2.00 | .... | ..... | NE 9420 | 0.75 | 15.00 | 1.25 | 25.00 |
| NE 1345 | 0.10 | 2.00 | .... | ..... | NE 9422 | 0.75 | 15.00 | 1.25 | 25.00 |
| NE 1350 | 0.10 | 2.00 | .... | ..... | NE 9425 | 0.75 | 15.00 | 1.25 | 25.00 |
| | | | | | NE 9427 | 0.75 | 15.00 | 1.25 | 25.00 |
| | | | | | NE 9430 | 0.75 | 15.00 | 1.25 | 25.00 |
| NE 8612 | 0.65¢ | $13.00 | $1.15 | $23.00 | NE 9432 | 0.75 | 15.00 | 1.25 | 25.00 |
| NE 8615 | 0.65 | 13.00 | 1.15 | 23.00 | NE 9435 | 0.75 | 15.00 | 1.25 | 25.00 |
| NE 8617 | 0.65 | 13.00 | 1.15 | 23.00 | NE 9437 | 0.75 | 15.00 | 1.25 | 25.00 |
| NE 8620 | 0.65 | 13.00 | 1.15 | 23.00 | NE 9440 | 0.75 | 15.00 | 1.25 | 25.00 |
| NE 8622 | 0.65 | 13.00 | 1.15 | 23.00 | NE 9442 | 0.80 | 16.00 | 1.30 | 26.00 |
| NE 8625 | 0.65 | 13.00 | 1.15 | 23.00 | NE 9445 | 0.80 | 16.00 | 1.30 | 26.00 |
| NE 8627 | 0.65 | 13.00 | 1.15 | 23.00 | NE 9447 | 0.80 | 16.00 | 1.30 | 26.00 |
| NE 8630 | 0.65 | 13.00 | 1.15 | 23.00 | NE 9450 | 0.80 | 16.00 | 1.30 | 26.00 |
| NE 8632 | 0.65 | 13.00 | 1.15 | 23.00 | | | | | |
| NE 8635 | 0.65 | 13.00 | 1.15 | 23.00 | | | | | |
| NE 8637 | 0.65 | 13.00 | 1.15 | 23.00 | NE 9722 | 0.65¢ | $13.00 | $1.15 | $23.00 |
| NE 8640 | 0.65 | 13.00 | 1.15 | 23.00 | NE 9727 | 0.65 | 13.00 | 1.15 | 23.00 |
| NE 8642 | 0.65 | 13.00 | 1.15 | 23.00 | NE 9732 | 0.65 | 13.00 | 1.15 | 23.00 |
| NE 8645 | 0.65 | 13.00 | 1.15 | 23.00 | NE 9737 | 0.65 | 13.00 | 1.15 | 23.00 |
| NE 8647 | 0.65 | 13.00 | 1.15 | 23.00 | NE 9742 | 0.65 | 13.00 | 1.15 | 23.00 |
| NE 8650 | 0.65 | 13.00 | 1.15 | 23.00 | NE 9745 | 0.65 | 13.00 | 1.15 | 23.00 |
| | | | | | NE 9747 | 0.65 | 13.00 | 1.15 | 23.00 |
| | | | | | NE 9750 | 0.65 | 13.00 | 1.15 | 23.00 |
| NE 8712 | 0.70¢ | $14.00 | $1.20 | $24.00 | NE 9763 | 0.65 | 13.00 | 1.15 | 23.00 |
| NE 8715 | 0.70 | 14.00 | 1.20 | 24.00 | NE 9768 | 0.65 | 13.00 | 1.15 | 23.00 |
| NE 8717 | 0.70 | 14.00 | 1.20 | 24.00 | | | | | |
| NE 8720 | 0.70 | 14.00 | 1.20 | 24.00 | | | | | |
| NE 8722 | 0.70 | 14.00 | 1.20 | 24.00 | NE 9830 | $1.30 | $26.00 | $1.80 | $36.00 |
| NE 8725 | 0.70 | 14.00 | 1.20 | 24.00 | NE 9832 | 1.30 | 26.00 | 1.80 | 36.00 |
| NE 8727 | 0.70 | 14.00 | 1.20 | 24.00 | NE 9935 | 1.30 | 26.00 | 1.80 | 36.00 |
| NE 8730 | 0.70 | 14.00 | 1.20 | 24.00 | NE 9837 | 1.30 | 26.00 | 1.80 | 36.00 |
| NE 8732 | 0.70 | 14.00 | 1.20 | 24.00 | NE 9840 | 1.30 | 26.00 | 1.80 | 36.00 |
| NE 8735 | 0.70 | 14.00 | 1.20 | 24.00 | NE 9842 | 1.30 | 26.00 | 1.80 | 36.00 |
| NE 8737 | 0.70 | 14.00 | 1.20 | 24.00 | NE 9845 | 1.30 | 26.00 | 1.80 | 36.00 |
| NE 8740 | 0.70 | 14.00 | 1.20 | 24.00 | NE 9847 | 1.30 | 26.00 | 1.80 | 36.00 |
| NE 8742 | 0.70 | 14.00 | 1.20 | 24.00 | NE 9850 | 1.30 | 26.00 | 1.80 | 36.00 |
| NE 8745 | 0.70 | 14.00 | 1.20 | 24.00 | | | | | |
| NE 8747 | 0.70 | 14.00 | 1.20 | 24.00 | | | | | |
| NE 8750 | 0.70 | 14.00 | 1.20 | 24.00 | NE 9912 | $1.20 | $24.00 | $1.55 | $31.00 |
| | | | | | NE 9915 | 1.20 | 24.00 | 1.55 | 31.00 |
| | | | | | NE 9917 | 1.20 | 24.00 | 1.55 | 31.00 |
| NE 9255 | 0.40¢ | $8.00 | .... | ..... | NE 9920 | 1.20 | 24.00 | 1.55 | 31.00 |
| NE 9260 | 0.40 | 8.00 | .... | .... | NE 9922 | 1.20 | 24.00 | 1.55 | 31.00 |
| NE 9261 | 0.65 | 13.00 | .... | .... | NE 9925 | 1.20 | 24.00 | 1.55 | 31.00 |
| NE 9262 | 0.65 | 13.00 | .... | ..... | | | | | |
| | | | | | NE 52100A | .... | ..... | $2.60 | $52.00 |
| | | | | | NE 52100B | .... | ..... | 2.60 | 52.00 |
| | | | | | NE 52100C | .... | ..... | 2.60 | 52.00 |

**Note 1:** The ranges shown are restricted to sizes 100 sq. in. or less or equivalent cross-sectional area 18 in. wide or under, with a maximum individual piece weight of 7000 lb. irrespective of size. **Note 2:** For steels ordered to such ranges, below the size and weight restriction, the average of all the chemical checks must be within the limits specified subject to check analysis variations given in Table 4, Section 10, A.I.S.I. Steel Products Manual. **Note 3:** When acid open-hearth is specified and acceptable, add to basic open-hearth alloy differential 0.25c. per lb. for bars and bar strip and $5 per gross ton for billets, blooms and slabs. **Note 4:** The extras shown are in addition to the base price of $2.70 for 100 lb. on finished products and $54 per gross ton on semi-finished steel, major basing points, and are in cents per pound when applicable to bars and bar-strip, and in dollars per gross ton when applicable to billets, blooms and slabs. The full extra applicable over the base price is the total of all extras indicated by the specific requirements of the order. The higher extra shall be charged for any size falling between two published extras.

## BASE QUANTITIES

*Standard unless otherwise keyed on prices.*

**HOT ROLLED:** Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

**COLD ROLLED:** Sheets, 400 to 1499 lb.; strip, extras on all quantities; bars, 1500 lb. base; NE alloy bars, 1000 to 39,999 lb.

**EXCEPTIONS:** (1) 150 to 499 lb. (2) 150 to 1499 lb. (3) 400 to 1499 lb. (4) 450 to 1499 lb. (5) 500 to 1499 lb. (6) 0 to 1999 lb. (7) 400 to 1999 lb. (8) 1000 to 1999 lb. (9) 450 to 3749 lb. (10) 400 to 3999 lb. (11) 300 to 4999 lb. (12) 300 to 10,000 lb. (13) 400 to 14,999 lb. (14) 400 lb. and over. (15) 1000 lb. and over. (16) 1500 lb. and over. (17) 2000 lb. and over. (18) 3500 lb. and over.

(*) Philadelphia: Galvanized sheet, 25 or more bundles.

Extra for size, quality, etc., apply on above quotations.

*Add 0.27lc. for sizes not rolled in Birmingham.

**City of Philadelphia only. Applicable freight rates must be added to basing point prices to obtain delivered price to other localities in metropolitan area.

## LAKE SUPERIOR ORES

(51.50% *Fe, Natural Content, Delivered Lower Lake Ports**)

| | *Per Gross Ton* |
|---|---|
| Old range, bessemer, 51.50 | $4.75 |
| Old range, non-bessemer, 51.50 | 4.60 |
| Mesaba, bessemer, 51.50 | 4.60 |
| Mesaba, non-bessemer, 51.50 | 4.45 |
| High phosphorus, 51.50 | 4.35 |

*Adjustments are made to indicate prices based on variance of Fe content of ores as analyzed on a dry basis by independent laboratories.

## FLUORSPAR

Maximum price f.o.b. consumer's plant, $30 per short ton plus either (1) rail freight from producer to consumer, or (2) rail freight from Rosiclare, Ill., to consumer, whichever is lower.

### *Exception*

When the WPB Steel Division certifies in writing the consumer's need for one of the higher grades of metallurgical fluorspar specified in the table below the price shall be taken from the table plus items (1 and 2) from paragraph above.

| Effective $CaF_2$ Content: | *Base price per short ton* |
|---|---|
| 70% or more | $33.00 |
| 65% but less than 70% | 32.00 |
| 60% but less than 65% | 31.00 |
| Less than 60% | 30.00 |

## PRICES

### SEMI-FINISHED STEEL

***Ingots, Carbon, Rerolling***

Base per gross ton, f.o.b. mill.... $31.00

*Exceptions:* Phoenix Iron Co. may charge $38.75; Kaiser Co., $43.00 f.o.b. Pacific Coast Ports; Empire Sheet & Tinplate Co., $34.25. Pgh. Steel Co. $33.10.

***Ingots, Carbon, Forging***

Base per gross ton, f.o.b. Birmingham, Buffalo, Chicago, Cleveland, Gary, Pittsburgh, Youngstown ..... $36.00

*Exceptions:* Phoenix Iron Co. may charge $43.00; Empire Sheet & Tinplate Co., $39.25, f.o.b. Mansfield, Ohio; West Coast producers, $48.00, f.o.b. Pacific Coast Ports. Pgh. Steel Co. $38.10.

***Ingots, Alloy***

Base per gross ton, f.o.b. Bethlehem, Buffalo, Canton, Coatesville, Chicago, Massillon, Pittsburgh ..... $45.00

*Exceptions:* C/L delivered Detroit add $2.00; delivered East Michigan add $3.00. Connors Steel Co. may charge $45.00 f.o.b. Birmingham.

***Billets, Blooms and Slabs***

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (rerolling only). Prices delivered Detroit are $2.00 higher; delivered E. Michigan, $3 higher; f.o.b. Duluth, billets only, $2.00 higher; billets f.o.b. Pacific ports are $12 higher. Provo, $11.20 higher. Delivered prices do not reflect three per cent tax on freight rates.

| | *Per Gross Ton* |
|---|---|
| Rerolling | $34.00 |
| Forging quality | 40.00 |

For exceptions on semi-finished steel see the footnote on the page of finished steel prices.

***Alloy Billets, Blooms, Slabs***

Pittsburgh, Chicago, Canton, Massillon, Buffalo, or Bethlehem, per gross ton ..... 54.00

Price delivered Detroit $2.00 higher; E. Michigan $3.00 higher.

***Shell Steel***

| | *Per Gross Ton* |
|---|---|
| 3 in. to 12 in. | $52.00 |
| 13 in. to 18 in. | 54.00 |
| 18 in. and over | 56.00 |

Basic open hearth shell steel, f.o.b. Pittsburgh, Chicago, Buffalo, Gary, Cleveland, Youngstown and Birmingham.

Prices delivered Detroit are $2.00 higher; E. Michigan, $3 higher.

Price Exception: Follansbee Steel Corp. permitted to sell at $13.00 per gross ton, f.o.b. Toronto, Ohio, above base price of $52.00.

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting, or quantity.

***Sheet Bars***

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point.

| | *Per Gross Ton* |
|---|---|
| Open hearth or bessemer | $34.00 |

***Skelp***

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

| | *Per Lb.* |
|---|---|
| Grooved, universal and sheared | 1.90c. |

***Wire Rods***

*(No. 5 to 9/32 in.)*

| | *Per Lb.* |
|---|---|
| Pittsburgh, Chicago, Cleveland | 2.00c. |
| Worcester, Mass. | 2.10c. |
| Birmingham | 2.00c. |
| San Francisco | 2.50c. |
| Galveston | 2.25c. |

9/32 in. to 47/64 in., 0.15c. a lb. higher. Quantity extras apply.

### TOOL STEEL

*(F.o.b. Pittsburgh, Bethlehem, Syracuse)*

| | *Base per lb.* |
|---|---|
| High speed | 67c. |
| Straight molybdenum | 54c. |
| Tungsten-molybdenum | 57½c. |
| High-carbon-chromium | 43c. |
| Oil hardening | 24c. |
| Special carbon | 22c. |
| Extra carbon | 18c. |
| Regular carbon | 14c. |

Warehouse prices east of Mississippi are 2c. a lb. higher; west of Mississippi 4c. higher.

# . . . faithfully serving industry in its mightiest war production!

As manufactured equipment and supplies flow from our factories to fighting men overseas, FIBREEN assures their arrival in first class condition . . . ready for action. This waterproof, scuff-proof, tear-resistant wrapping material successfully protects war supplies from dampness, wind, rain, sleet, ice and salt water.

Kraft paper, reenforced with crossed layers of steel-like sisal fibre embedded in water-proof adhesive, makes a low-cost protective wrapping of unmatched durability. These properties of FIBREEN, so vital to the war effort, are ones you need to protect your postwar goods enroute to your customers.

## Use FIBREEN to Cut Postwar Shipping Costs!

Losses in transit were cut from 18% to less than 1% when a manufacturer of powdery material lined freight cars with FIBREEN before loading. A leather manufacturer substituted FIBREEN for crates, burlap and paper, and made a substantial saving in wrapping cost *and transportation charges.* Sheet steel, formerly loaded by hand into box cars, was wrapped in FIBREEN and loaded by crane into open cars!—*saved thousands of dollars!*

These and many other examples of SISALKRAFT research and engineering service warrant your consideration. SISALKRAFT leadership is the result of the unmatched performance of its products and nearly 25 years in the development of better wrapping methods with sisal-reenforced sheets.

*Ask SISALKRAFT to help cut your wrapping and shipping costs!*

THE SISALKRAFT CO.
205 W. WACKER DRIVE · CHICAGO 6, ILL.
NEW YORK · SAN FRANCISCO · LONDON · SYDNEY

*Manufacturers of* SISALKRAFT, FIBREEN, SISAL-X, SISALTAPE AND COPPER-ARMORED SISALKRAFT

CLEVELAND Top Quality FASTENERS

The Cleveland Cap Screw Company

2929 EAST 79TH STREET • CLEVELAND 4, OHIO

Warehouses: Chicago, Philadelphia, New York, Los Angeles

MADE BY THE ORIGINATORS OF THE KAUFMAN PROCESS FOR GREATER STRENGTH AND ACCURACY



Big Installations
or Small Parts--

*Call* **BRANDT**
**of Baltimore**

*for precision in Heavy Plate and Sheet Steel Work*

Here is an 8½ acre plant . . . with the most modern equipment for shearing, rolling, forming, welding and completely fabricating ferrous, non-ferrous and alloy metals to your specifications . . . from the lightest gauge up to and including 1¼" mild steel or ¾" armor plate. Extensive war contracts necessarily limit our present acceptance of new business for immediate delivery. Address:
Charles T. Brandt, Inc.,
Baltimore-30, Md.

**BRIGHTENING FURNACE,** 44 ft. high, for use with Continuous Electrolytic Tinning Lines . . . Furnaces and Tinning Lines engineered, fabricated and installed by Brandt.

BRANDT of Baltimore—*Craftsmen in Metal Since 1890*


## PRICES

### WELDED PIPE AND TUBING

*Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills*
*(F.o.b. Pittsburgh only on wrought pipe)*
*Base Price—$200.00 per Net Ton*

| | Black | Galv. |
|---|---|---|
| ***Steel (Butt Weld)*** | | |
| ⅛ in. | 63½ | 51 |
| ¼ in. | 66½ | 55 |
| ⅜ to 3 in. | 68½ | 57½ |
| ***Wrought Iron (Butt Weld)*** | | |
| ⅛ in. | 24 | 3½ |
| ¼ in. | 30 | 10 |
| ⅜ and 1¼ in. | 34 | 16 |
| 1½ in. | 38 | 18½ |
| 2 in. | 37½ | 18 |
| ***Steel (Lap Weld)*** | | |
| 2 in. | 61 | 49½ |
| 2½ and 3 in. | 64 | 53½ |
| 3½ to 6 in. | 66 | 54½ |
| ***Wrought Iron (Lap Weld)*** | | |
| 2 in. | 30½ | 13 |
| 2½ to 3½ in. | 31½ | 14½ |
| 4 in. | 33½ | 18 |
| 4½ to 8 in. | 32½ | 17 |
| ***Steel (Butt, extra strong, plain ends)*** | | |
| ⅛ in. | 61½ | 50½ |
| ¼ in. | 65½ | 54½ |
| ⅜ to 3 in. | 67 | 57 |
| ***Wrought Iron (Same as Above)*** | | |
| ⅛ in. | 25 | 6 |
| ¼ in. | 31 | 12 |
| ⅜ to 2 in. | 38 | 19½ |
| ***Steel (Lap, extra strong, plain ends)*** | | |
| 2 in. | 59 | 48½ |
| 2½ and 3 in. | 63 | 53½ |
| 3½ to 6 in. | 66½ | 56 |
| ***Wrought Iron (Same as Above)*** | | |
| 2 in. | 33½ | 15½ |
| 2½ to 4 in. | 39 | 22½ |
| 4½ to 6 in. | 37½ | 21 |

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or $2 a ton higher on all butt weld.

### CAST IRON WATER PIPE

| | Per Net Ton |
|---|---|
| 6-in. and larger, del'd Chicago | $54.80 |
| 6-in. and larger, del'd New York | 52.30 |
| 6-in. and larger, Birmingham | 46.00 |
| 6-in. and larger f.o.b. cars, San Francisco or Los Angeles | 68.40 |
| 6-in. and larger f.o.b. cars, Seattle. | 71.30 |

Class "A" and gas pipe, $3 extra; 4-in. pipe is $3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons or over, 6-in. and larger are $45 at Birmingham and $53.80 delivered Chicago, $59.40 at San Francisco and Los Angeles, and $70.30 at Seattle. Delivered prices do not reflect new 3 per cent tax on freight rates.

### BOILER TUBES

*Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes, Minimum Wall. Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots.*

| | Seamless Cold Drawn | Seamless Hot Rolled | Lap Weld, Hot Rolled |
|---|---|---|---|
| 2 in. o.d. 13 B.W.G. | 15.03 | 13.04 | 12.31 |
| 2½ in. o.d. 12 B.W.G. | 20.31 | 17.54 | 16.53 |
| 3 in. o.d. 12 B.W.G. | 22.48 | 19.50 | 18.35 |
| 3½ in. o.d. 11 B.W.G. | 28.37 | 24.62 | 23.19 |
| 4 in. o.d. 10 B.W.G. | 35.20 | 30.54 | 28.69 |

*(Extras for less carload quantities)*

| | |
|---|---|
| 40,000 lb. or ft., and over | Base |
| 30,000 lb. or ft. to 39,999 lb. or ft. | 5% |
| 20,000 lb. or ft. to 29,999 lb. or ft. | 10% |
| 10,000 lb. or ft. to 19,999 lb. or ft. | 20% |
| 5,000 lb. or ft. to 9,999 lb. or ft. | 30% |
| 2,000 lb. or ft. to 4,999 lb. or ft. | 45% |
| Under 2,000 lb. or ft. | 65% |

## PRICES

### WIRE PRODUCTS

*To the trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth*

| | Basing Points Named | Pacific Coast Basing Points† |
|---|---|---|
| | *Base per Keg* | |
| Standard wire nails | $2.55 | $3.05 |
| Coated nails | 2.55 | 3.05 |
| Cut nails, carloads | 3.85 | .... |
| | *Base per 100 Lb.* | |
| Annealed fence wire | $3.05 | $3.55 |
| Annealed galv. fence wire | 3.40 | 3.90 |
| | *Base Column* | |
| Woven wire fence* | $0.67 | $0.85 |
| Fence posts, carloads | .69 | .86 |
| Single loop bale ties | .59 | .84 |
| Galvanized barbed wire** | .70 | .80 |
| Twisted barbless wire | .70 | .... |

*15½ gage and heavier. **On 80-rod spools in carload quantities.
†Prices subject to switching or transportation charges.

### BOLTS, NUTS, RIVETS, SET SCREWS

***Bolts and Nuts***

*(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)*

**Machine and Carriage Bolts:**

*Base discount less case lots*

| | *Per Cent Off List* |
|---|---|
| ½ in. & smaller x 6 in. & shorter | 65½ |
| 9/16 & ⅝ in. x 6 in. & shorter | 63½ |
| ¾ to 1 in. x 6 in. & shorter | 61 |
| 1⅛ in. and larger, all lengths | 59 |
| All diameters over 6 in. long | 59 |
| Lag, all sizes | 62 |
| Plow bolts | 65 |

**Nuts, Cold Punched or Hot Pressed:**
*(Hexagon or Square)*

| | |
|---|---|
| ½ in. and smaller | 62 |
| 9/16 to 1 in. inclusive | 59 |
| 1⅛ to 1½ in. inclusive | 57 |
| 1⅝ in. and larger | 56 |

On above bolts and nuts, excepting plow bolts, additional allowance of 10 per cent for full container quantities. There is an additional 5 per cent allowance for carload shipments.

| Semi-Fin. Hexagon Nuts | U.S.S. | S.A.E. |
|---|---|---|
| *Base discount less keg lots* | | |
| 7/16 in. and smaller | .. | 64 |
| ½ in. and smaller | 62 | .. |
| ⅝ in. through 1 in. | .. | 60 |
| 9/16 in. to 1 in. | 59 | .. |
| 1⅛ in. through 1½ in. | 57 | 58 |
| 1⅝ in. and larger | 56 | .. |

In full keg lots, 10 per cent additional discount.

| ***Stove Bolts*** | *Consumer* |
|---|---|
| Packages, nuts loose | 71 and 10 |
| In packages, with nuts attached | 71 |
| In bulk | 80 |

On stove bolts freight allowed up to 65c per 100 lb. based on Cleveland, Chicago, New York on lots of 200 lb. or over.

***Large Rivets***
*(½ in. and larger)*

| | *Base per 100 lb.* |
|---|---|
| F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham | $3.75 |

***Small Rivets***
*(7/16 in. and smaller)*

| | *Per Cent Off List* |
|---|---|
| F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham | 65 and 5 |

| ***Cap and Set Screws*** | *Consumer Per Cent Off List* |
|---|---|
| Upset full fin. hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in. | 64 |
| Upset set screws, cup and oval points | 71 |
| Milled studs | 46 |
| Flat head cap screws, listed sizes | 36 |
| Fillister head cap, listed sizes | 51 |

Freight allowed up to 65c per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

### ROOFING TERNE PLATE

*(F.o.b. Pittsburgh, 112 Sheets)*

| | 20x14 in. | 20x28 in. |
|---|---|---|
| 8-lb. coating I.C. | $6.00 | $12.00 |
| 15-lb. coating I.C. | 7.00 | 14.00 |
| 18-lb. coating I.C. | 7.50 | 15.00 |


# THOMAS
## Flexible COUPLINGS
### FOR *any* SPEED OR SERVICE

TYPE DBZ

TYPE DSM

TYPE CM

TYPE ST

TYPE AM

TYPE MT

TYPE SS

*Eliminate*

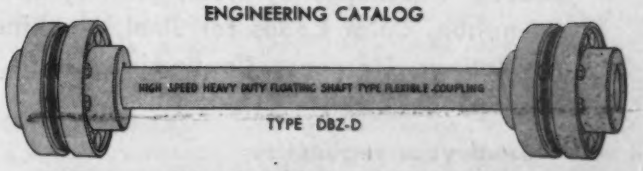
BACKLASH, FRICTION, WEAR AND CROSS-PULL

.....the 4 destructive evils found in all other types and makes of couplings.

NO BACKLASH
NO WEAR
NO LUBRICATION
NO THRUST
FREE END FLOAT

These are the five essential features of Thomas Flexible Couplings that insure a permanent care-free installation.

WRITE FOR COMPLETE ENGINEERING CATALOG




TYPE DBZ-D

**THE THOMAS PRINCIPLE ELIMINATES CHAINS, SPUR GEARS and other VIBRATING MAKESHIFTS**

**THOMAS FLEXIBLE COUPLING CO.**
WARREN, PENNSYLVANIA

## PIG IRON

**All prices set in bold face type are maxima established by OPA on June 24, 1941. Other domestic prices (in italics) are delivered quotations per gross ton computed on the basis of the official maxima. Delivered prices do not reflect 3 per cent tax on freight rates.**

| | No. 2 Foundry | Basic | Bessemer | Malleable | Low Phosphorus | Charcoal |
|---|---|---|---|---|---|---|
| Boston | *$25.50* | *$25.00* | *$26.50* | *$26.00* | ..... | ..... |
| Brooklyn | *27.50* | *27.00* | ..... | *28.00* | ..... | ..... |
| Jersey City | *26.53* | *26.03* | *27.53* | *27.03* | ..... | ..... |
| Philadelphia (4) | *25.84* | *25.34* | *26.84* | *26.34* | *$30.74* | ..... |
| Bethlehem, Pa. | 25.00 | 24.50 | 26.00 | 25.50 | ..... | ..... |
| Everett, Mass. | 25.00 | 24.50 | 26.00 | 25.50 | ..... | ..... |
| Swedeland, Pa. | 25.00 | 24.50 | 26.00 | 25.50 | ..... | ..... |
| Steelton, Pa. | ..... | 24.50 | ..... | ..... | 29.50 | ..... |
| Birdsboro, Pa. (3) | 25.00 | 24.50 | 26.00 | 25.50 | 29.50 | ..... |
| Sparrows Point, Md. | 25.00 | 24.50 | ..... | ..... | ..... | ..... |
| Erie, Pa. | 24.00 | 23.50 | 25.00 | 24.50 | ..... | ..... |
| Neville Island, Pa. | 24.00 | 23.50 | 24.50 | 24.00 | ..... | ..... |
| Sharpsville, Pa. (1) | 24.00 | 23.50 | 24.50 | 24.00 | ..... | ..... |
| Buffalo | 24.00 | 23.00 | 25.00 | 24.50 | 29.50 | ..... |
| Cincinnati, Ohio | *25.11* | *24.61* | ..... | *25.11* | ..... | ..... |
| Canton, Ohio | *25.39* | *24.89* | *25.89* | *25.39* | *32.69* | ..... |
| Mansfield, Ohio | *25.94* | *25.44* | *26.44* | *25.94* | *32.86* | ..... |
| St. Louis | *24.50* | *24.50* | ..... | ..... | ..... | ..... |
| Chicago | 24.00 | 23.50 | 24.50 | 24.00 | *35.46* | *$37.34* |
| Granite City, Ill. | 24.00 | 23.50 | 24.50 | 24.00 | ..... | ..... |
| Cleveland | 24.00 | 23.50 | 24.50 | 24.00 | *32.42* | ..... |
| Hamilton, Ohio | 24.00 | 23.50 | ..... | 24.00 | ..... | ..... |
| Toledo | 24.00 | 23.50 | 24.50 | 24.00 | ..... | ..... |
| Youngstown | 24.00 | 23.50 | 24.50 | 24.00 | *32.42* | ..... |
| Detroit | 24.00 | 23.50 | 24.50 | 24.00 | ..... | ..... |
| Lake Superior fc. | ..... | ..... | ..... | ..... | ..... | 34.00 |
| Lyles, Tenn. fc. (2) | ..... | ..... | ..... | ..... | ..... | 33.00 |
| St. Paul | *26.63* | *26.13* | *27.13* | *26.63* | *39.80* | ..... |
| Duluth | 24.50 | 24.00 | 25.00 | 24.50 | ..... | ..... |
| Birmingham | 20.38 | 19.00 | 25.00 | ..... | ..... | ..... |
| Los Angeles | *26.95* | ..... | ..... | ..... | ..... | ..... |
| San Francisco | *26.95* | ..... | ..... | ..... | ..... | ..... |
| Seattle | *26.95* | ..... | ..... | ..... | ..... | ..... |
| Provo, Utah | 22.00 | 21.50 | ..... | ..... | ..... | ..... |
| Montreal | *27.50* | *27.50* | ..... | *28.00* | ..... | ..... |
| Toronto | *25.50* | *25.50* | ..... | *26.00* | ..... | ..... |

GRAY FORGE IRON: Valley or Pittsburgh furnace ..... $23.50

(1) Pittsburgh Coke & Iron Co. (Sharpsville, Pa., furnace only) and the Struthers Iron and Steel Co., Struthers, Ohio, may charge 50c. a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable. Struthers Iron and Steel Co. may add another $1.00 per gross ton for iron from Struthers, Ohio, plant.

(2) Price shown is for low-phosphorous iron; high phosphorous sells for $25.50 at the furnace.

(3) E. & G. Brooke Co. Birdsboro, Pa., permitted to charge $1.00 per ton extra.

(4) Pittsburgh Ferromanganese Co. (Chester furnace only) may charge $2.25 a ton over maximum basing point prices.

Basing point prices are subject to switching charges; Silicon differentials (not to exceed 50c. a ton for each 0.25 per cent silicon content in excess of base grade which is 1.75 to 2.25 per cent); Phosphorus differentials, a reduction of 38c. per ton for phosphorus content of 0.70 per cent and over; Manganese differentials, a charge not to exceed 50c. per ton for each 0.50 per cent manganese content in excess of 1.00 per cent. Effective March 3, 1943, $2 per ton extra may be charged for 0.5 to 0.75 per cent nickel content and $1 per ton extra for each additional 0.25 per cent nickel.


★ ★

*For*

**Purchasing Agents, Buyers, Foremen, Superintendents**

**A BOOK CONTAINING THE FOLLOWING TABLES:**

(Size 5½ x 8½)

**Mensuration, Trigonometric Functions, Areas, Volumes, Lengths of Arcs, Weights of Materials, Standard Gauges of Sheets, Plates and Wires, Weights and Areas of Square and Round Bars, Weights of High Speed Steels, Gauge Thicknesses, Expansion by Heat, Electroplating Information, Color Codes for Steel, Machineability Ratings, Hardness Conversion Charts, Cutting Speeds, etc.**

Send your request to

**GENERAL REFINERIES, INC.**

27 NORTH 4TH STREET, MINNEAPOLIS 1, MINN.

P. O. BOX 1124

★ ★


## METAL POWDERS

Prices are based on current market prices of ingots plus a fixed figure. F.o.b. shipping point, c. per lb., ton lots.

| | |
|---|---|
| Copper, electrolytic, 150 and 200 mesh | 21½ to 23½c |
| Copper, reduced, 150 and 200 mesh | 20½ to 25½c. |
| Iron, commercial, 100 and 200 mesh, 96 + % Fe | 13½ to 15c. |
| Iron, crushed, 200 mesh and finer, 90 + % Fe, carload lots | 4c. |
| Iron, hydrogen reduced, 300 mesh and finer, 98½ + % Fe, drum lots | 63c. |
| Iron, electrolytic, unannealed, 300 mesh and coarser, 99 + % Fe | 30 to 33c. |
| Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe | 42c. |
| Iron, carbonyl, 300 mesh and finer, 98-99.8 + % Fe | 90c. |
| Aluminum, 100 and 200 mesh | *23 to 27c. |
| Antimony, 100 mesh | 20.6c. |
| Cadmium, 100 mesh | $1 |
| Chromium, 150 mesh | $1.03 |
| Lead, 100, 200 & 300 mesh, | 11½ to 12½c. |
| Manganese, 150 mesh | 51c. |
| Nickel, 150 mesh | 51½c. |
| Solder powder, 100 mesh, 8½c. plus metal | |
| Tin, 100 mesh | 58¾c. |
| Tungsten metal powder, 98%-99%, any quantity, per lb. | $2.60 |
| Molybdenum powder, 99%, in 200-lb. kegs, f.o.b. York, Pa., per lb. | $2.60 |
| Under 100 lb. | $3.00 |

*Freight allowed east of Mississippi.

## COKE

| Furnace, beehive (f.o.b. oven) | Net Ton |
|---|---|
| Connellsville, Pa. | $7.00* |
| **Foundry, beehive (f.o.b. oven)** | |
| Fayette Co., W. Va. | 8.10 |
| Connellsville, Pa. | 8.25 |
| **Foundry, By-Product** | |
| Chicago, del'd | 13.38 |
| Chicago, f.o.b. | 12.60 |
| New England, del'd | 14.25 |
| Kearny, N. J., f.o.b. | 12.65 |
| Philadelphia, del'd | 12.88 |
| Buffalo, del'd | 13.00 |
| Portsmouth, Ohio, f.o.b. | 11.10 |
| Painesville, Ohio, f.o.b. | 11.75 |
| Erie, del'd | 12.75 |
| Cleveland, del'd | 12.80 |
| Cincinnati, del'd | 12.85 |
| St. Louis, del'd | 13.85 |
| Birmingham, del'd | 10.50 |

*Hand drawn ovens using trucked coal permitted to charge $7.75 per ton plus transportation charges. **Mo., Ala. and Tenn. producers—$13.35.

## PRICES

### REFRACTORIES
*(F.o.b. Works)*

| *Fire Clay Brick* | *Per 1000* |
|---|---|
| Super-duty brick, St. Louis | $64.60 |
| First quality, Pa., Md., Ky., Mo., Ill. | 51.30 |
| First quality, New Jersey | 56.00 |
| Sec. quality, Pa., Md., Ky., Mo., Ill. | 46.55 |
| Second quality, New Jersey | 51.00 |
| No. 1, Ohio | 43.00 |
| Ground fire clay, net ton | 7.60 |
| ***Silica Brick*** | |
| Pennsylvania and Birmingham | $51.30 |
| Chicago District | 58.90 |
| Silica cement, net ton (Eastern) | 9.00 |
| ***Chrome Brick*** | *Per Net Ton* |
| Standard chemically bonded, Balt., Plymouth Meeting, Chester | $54.00 |
| ***Magnesite Brick*** | |
| Standard, Balt. and Chester | $76.00 |
| Chemically bonded, Baltimore | 65.00 |
| ***Grain Magnesite*** | |
| Domestic, f.o.b. Balt. and Chester in sacks (carloads) | $43.48 |
| Domestic, f.o.b. Chewelah, Wash. (in bulk) | 22.00 |

### RAILS, TRACK SUPPLIES
*(F.o.b. Mill)*

Standard rails, heavier than 60 lb., No. 1 O.H., gross ton ..... $40.00
Angle splice bars, 100 lb. ..... 2.70

| *(F.o.b. Basing Points)* | *Per Gross Ton* |
|---|---|
| Light rails (from billets) | $40.00 |
| Light rails (from rail steel) | 39.00 |

| | *Base per Lb.* |
|---|---|
| Cut spikes | 3.00c. |
| Screw spikes | 5.15c. |
| Tie plates, steel | 2.15c. |
| Tie plates, Pacific Coast | 2.30c. |
| Track bolts | 4.75c. |
| Track bolts, heat treated, to railroads | 5.00c. |
| Track bolts, jobbers discount | 63-5 |

Basing points, light rails, Pittsburgh, Chicago, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa., Richmond, Oregon and Washington ports, add 25c.

### CORROSION AND HEAT-RESISTING STEEL
*(Per lb. base price, f.o.b. Pittsburgh)*

***Chromium-Nickel Alloys***

| | No. 304 | No. 302 |
|---|---|---|
| Forging billets | 21.25c. | 20.40c. |
| Bars | 25.00c. | 24.00c. |
| Plates | 29.00c. | 27.00c. |
| Structural shapes | 25.00c. | 24.00c. |
| Sheets | 36.00c. | 34.00c. |
| Hot rolled strip | 23.50c. | 21.50c. |
| Cold rolled strip | 30.00c. | 28.00c. |
| Drawn wire | 25.00c. | 24.00c. |

***Straight-Chromium Alloys***

| | No. 410 | No. 430 | No. 442 | No. 446 |
|---|---|---|---|---|
| F.Billets | 15.725c. | 16.15c. | 19.125c. | 23.375c. |
| Bars | 18.50c. | 19.00c. | 22.50c. | 27.50c. |
| Plates | 21.50c. | 22.00c. | 25.50c. | 30.50c. |
| Sheets | 26.50c. | 29.00c. | 32.50c. | 36.50c. |
| Hot strip | 17.00c. | 17.50c. | 24.00c. | 35.00c. |
| Cold strip | 22.00c. | 22.50c. | 32.00c. | 52.00c. |

***Chromium-Nickel Clad Steel (20%)***

| | No. 304 |
|---|---|
| Plates | 18.00c.* |
| Sheets | 19.00c. |

*Includes annealing and pickling.

### ELECTRICAL SHEETS
*(Base, f.o.b. Pittsburgh)*

| | *Per Lb.* |
|---|---|
| Field grade | 3.20c. |
| Armature | 3.55c. |
| Electrical | 4.05c. |
| Motor | 4.95c. |
| Dynamo | 5.65c. |
| Transformer 72 | 6.15c. |
| Transformer 65 | 7.15c. |
| Transformer 58 | 7.65c. |
| Transformer 52 | 8.45c. |

F.o.b. Granite City, add 10c. per 100 lb. on field grade to and including dynamo. Pacific ports add 75c. per 100 lb. on all grades.

HEAT-TREATED STEEL SHOT

# We manufacture shot and grit for endurance

A shot or grit that will blast fast with a clean finish.

This is the only reason why so many operators are daily changing to our shot and grit, from Maine to California.

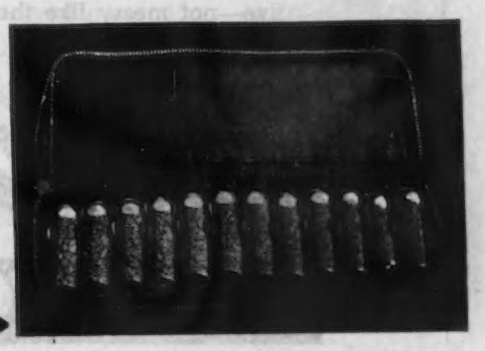
The unprecedented demand for our—

**Heat-Treated Steel Shot and Heat-Treated Steel Grit**

has enabled us to expand our production and maintain a quality that is more than satisfactory to our hundreds of customers all over the country.

**HARRISON ABRASIVE CORPORATION**

**Manchester, New Hampshire**



HEAT-TREATED STEEL GRIT

## *Pick your air valves from this complete line*

Rotary Type—ratchet action for advance and return of cylinder. 3 sizes.

Hand Operated Valves; 15 sizes and types.

Foot Operated Treadle Valve; 9 sizes and types.

Spring Return Foot or Hand Operated Valves; 6 sizes and types.

Pressure Regulating Valve. —Piston Type, Sensitive Control.

Manifold Type, bottom connection. Used individually or with made-to-order manifolds. 9 sizes and types.

Hannifin "Pack-less" Air Control Valves give you a complete range of choice in hand and foot operated models, for control of any single or double acting cylinder. Any Hannifin Valve will give you positive, accurate control of air operated equipment, plus a simple, effective valve design that assures long service with minimum attention.

Write for Valve Bulletin 57. Hannifin Manufacturing Company, 621-631 South Kolmar Avenue, Chicago 24, Illinois.

**Hannifin**

**AIR CONTROL VALVES**

# AND THE MARKS STAY ON!

"Reddy" Markal

All-important identifying marks made with MARKAL PAINTSTIKS won't come off—unless you take them off. Sun, rain, cold, sleet, snow—no weather condition can destroy them. Besides, MARKAL PAINTSTIKS penetrate wet, moisture-frozen, or oily surfaces—they mark right through them.

MARKAL PAINTSTIKS are made of special weather-resistant paint. The marks are clear, distinct, positive—not messy like the old paint bucket and brush method. Your records are safe and permanent when you "Mark with Markal".

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## PRICES

### *Ferromanganese*

78-82% Mn, maximum contract base price per gross ton, lump size, f.o.b. cars at Baltimore, Bethlehem, Philadelphia, New York, Birmingham, Rockdale, Rockwood, Tenn.

| | |
|---|---|
| Carload lots (bulk) | $136.00 |
| Carload lots (packed) | 141.00 |
| Less ton lots (packed) | 148.50 |

Premium, $1.70 for each 1% above 82% Mn; penalty, $1.70 for each 1% below 78%.

### *Manganese Metal*

Contract basis, lump size, per lb. of metal, f.o.b. shipping point with freight allowed. Spot sales add 2c. per lb.

96-98% Mn, .2% max. C, 1% max. Si, 2% max. Fe.

| | |
|---|---|
| Carload, bulk | 34c |
| L.c.l. lots | 38c |

95-97% Mn, .2% max. C, 1.5% max. Si, 2.5% max. Fe.

| | |
|---|---|
| Carload, bulk | 34c |
| L.c.l. lots | 35c |

### *Spiegeleisen*

Maximum base, contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

| | 16-19% Mn 3% max. Si | 19-21% Mn 3% max. Si |
|---|---|---|
| Carloads | $35.00 | $36.00 |
| Less ton | 47.50 | 48.50 |

### *Electric Ferrosilicon*

OPA maximum base price cents per lb. contained Si, lump size in carlots, f.o.b. shipping point with freight allowed to destination.

| | Eastern Zone | Central Zone | Western Zone |
|---|---|---|---|
| 50% Si | 6.65c. | 7.10c. | 7.25c. |
| 75% Si | 8.05c. | 8.20c. | 8.75c. |
| 80-90% Si | 8.90c. | 9.05c. | 9.55c. |
| 90-95% Si | 11.05c. | 11.20c. | 11.65c. |

Spot sales add: .45c. per lb. for 50% Si, .3c. per lb. or 75% Si .25c. per lb. for 80-90% and 90-95% Si.

### *Silvery Iron*

*(C/L, Per Gross Ton, base* 6.00 to 6.50 *Si)*

| | |
|---|---|
| F.o.b. Jackson, Ohio | $29.50* |
| Buffalo | 30.75* |

For each additional 0.50% silicon add $1 a ton. For each 0.50% manganese over 1% add 50c. a ton. Add $1 a ton for 0.75% phosphorous or over.

*OPA price established 6-24-41.

### *Bessemer Ferrosilicon*

Prices are $1 a ton above silvery iron quotations of comparable analysis.

### *Silicon Metal*

OPA maximum base price per lb. of contained Si, lump size, f.o.b. shipping point with freight allowed to destination for l.c.l. above 2000 lb., packed. Add .25c. for spot sales.

| | Eastern Zone | Central Zone | Western Zone |
|---|---|---|---|
| 96% Si, 2% Fe. | 13.10c. | 13.55c. | 16.50c. |
| 97% Si, 1% Fe. | 13.45c. | 13.90c. | 16.80c. |

### *Ferrosilicon Briquets*

OPA maximum base price per lb. of briquet, bulk, f.o.b. shipping point with freight allowed to destination. Approximately 40% Si. Add .25c. for spot sales.

| | Eastern Zone | Central Zone | Western Zone |
|---|---|---|---|
| Carload, bulk | 3.35c. | 3.50c. | 3.65c. |
| 2000 lb.-carload | 3.8c. | 4.2c. | 4.35c. |

### *Silicomanganese*

Contract basis lump size, per lb. of metal, f.o.b. shipping point with freight allowed. Add .25c. for spot sales. 65-70% Mn, 17-20% Si, 1.5% max. C.

| | |
|---|---|
| Carload, bulk | 6.05c. |
| 2000 lb. to carload | 6.70c. |
| Under 2000 lb. | 6.90c. |
| Briquets, contract, basis carlots, bulk freight allowed, per lb. | 5.80c. |
| 2000 lb. to carload | 6.50c. |
| Less ton lots | 6.65c. |

### *Ferrochrome*

*(65-72% Cr, 2% max. Si)*

OPA maximum base contract prices per lb. of contained Cr, lump size in carload lots, f.o.b. shipping point, freight allowed to destination. Add .25c. per lb. contained Cr for spot sales.

| | Eastern Zone | Central Zone | Western Zone |
|---|---|---|---|
| 0.06% C | 22.00c. | 23.40c. | 24.00c. |
| 0.10% C | 22.50c. | 22.90c. | 23.50c. |
| 0.15% C | 22.00c. | 22.40c. | 23.00c. |
| 0.20% C | 21.50c. | 21.90c. | 22.50c. |
| 0.50% C | 21.00c. | 21.40c. | 22.00c. |
| 1.00% C | 20.50c. | 20.90c. | 21.50c. |
| 2.00% C | 19.50c. | 19.90c. | 21.00c. |
| 66-71% Cr, 4-10% C | 13.00c. | 13.40c. | 14.00c. |

### *Other Ferroalloys*

Ferrotungsten, Standard grade, lump or ¼X down, packed, f.o.b. plant at Niagara Falls, New York, Washington, Pa., York, Pa., per lb. contained tungsten, 10,000 lb. or more... $1.90

Ferrovanadium, 35-55%, contract basis, f.o.b. producer's plant, usual freight allowances, per lb. contained Va.
- Open Hearth ..... $2.70
- Crucible ..... $2.80
- Primos ..... $2.90

Cobalt, 97% min., keg packed, contract basis, f.o.b. producer's plant, usual freight allowances, per lb. of cobalt metal..... $1.50

Vanadium pentoxide, 88%-92% $V_2O_5$ technical grade, contract basis, any quantity, per lb. contained $V_2O_5$. Spot sales add 5c. per lb. contained $V_2O_5$..... $1.10

Ferroboron, contract basis, 17.50% min. Bo, f.o.b. producer's plant with usual freight allowances, per lb. of alloy.
- 2000 lb. to carload..... $1.20
- Under 2000 lb..... 1.30

Silcaz No. 3, contract basis, f.o.b. producer's plant with usual freight allowances, per lb. of alloy. (Pending OPA approval)
- Carload lots ..... 25c.
- 2000 lb. to carload..... 26c.

Silvaz No. 3, contract basis, f.o.b. producer's plant with freight allowances, per lb. of alloy (Pending OPA approval)
- Carload lots ..... 58c.
- 2000 lb. to carload..... 59c.

Grainal, f.o.b. Bridgeville, Pa., freight allowed 50 lb. and over, max. based on rate to St. Louis
- No. 1 ..... 87.5c.
- No. 6 ..... 60c.
- No. 79 ..... 45c.

Bortram, f.o.b. Niagara Falls
- Ton lots, per lb..... 45c.
- Less ton lots, per lb..... 50c.

Ferrocolumbium, 50-60%, contract basis, f.o.b. plant with freight allowances, per lb. contained Cb.
- 2000 lb. lots ..... $2.25
- Under 2000 lb. lots ..... $2.30

Ferrotitanium, 40%-45%, f.o.b. 0.10c. max. Niagara Falls, N. Y., ton lots, per lb. contained Ti.. $1.23
- Less ton lots ..... $1.25

Ferrotitanium, 20%-25%, 0.10 C max., ton lots, per lb. contained titanium ..... $1.35
- Less ton lots ..... $1.40

High-carbon ferrotitanium, 15%-20%, 6%-8% carbon, contract basis, f.o.b. Niagara Falls, N. Y., freight allowed East of Mississippi River, North of Baltimore and St. Louis, per carload .... $142.50

Ferrophosphorus, 18% electric or blast furnaces, f.o.b. Anniston, Ala., carlots, with $3 unitage freight equalled with Rockdale, Tenn., per gross ton ..... $58.50

Ferrophosphorus, electrolytic 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., $3 unitage freight equalized with Nashville, per gross ton ..... $75.00

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., any quantity, per lb. contained Mo. 95c.

Calcium molybdate, 40%-45%, f.o.b. Langeloth and Washington, Pa., any quantity, per lb. contained Mo. ..... 80c.,

Molybdenum oxide briquetes, 48%-52% Mo, f.o.b. Langeloth, Pa., per lb. contained Mo ..... 80c.

Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per lb. contained Mo ..... 80c.

Zirconium, 35-40%, contract basis, f.o.b. producer's plant with freight allowances, per lb. of alloy. Add ¼c. for spot sales
- Carload lots ..... 14c.

Zirconium, 12-15%, contract basis, lump f.o.b. plant usual freight allowances, per lb. of alloy
- Carload, bulk ..... 4.6c.

Alsifer (approx. 20% Al, 40% Si and 40% Fe), contract basis, f.o.b. Niagara Falls, carload, bulk ..... 5.75c.
- Ton lots ..... 7.25c.

Simanal (approx. 20% Si, 20% Mn, 20% Al), contract basis, f.o.b. Philo, Ohio, with freight not to exceed St. Louis rate allowed, per lb.
- Car lots ..... 8.75c.
- Ton lots ..... 9.25c.

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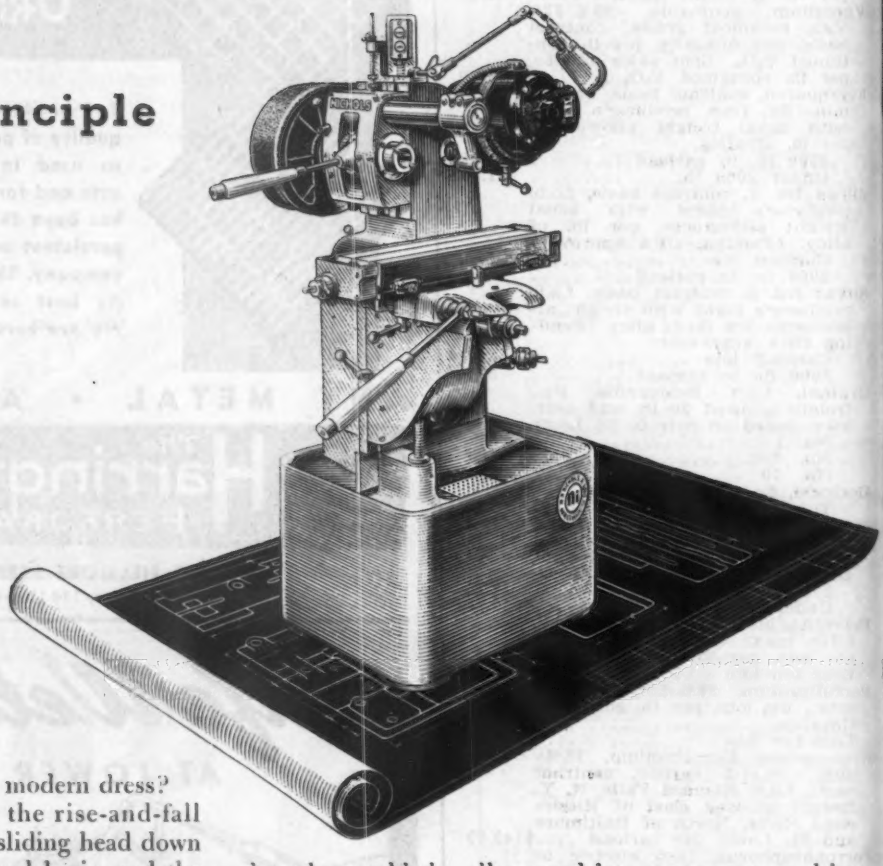
# How *Mass-Precision* put New Purpose into an Old Principle



Recognize this famous old miller in its modern dress?

Old-time machinists valued it for the rise-and-fall spindle which brought the cutter on a sliding head down to the work. This principle was new and basic, and the miller enjoyed many years of success. With accelerated production, however, industry demanded greater versatility, rigidity and accuracy in its machines. Operating men began to label the miller a "has-been"...until Nichols decided to *mass-precision* it.

The engineering insight of "Accurate" Nichols appraised its many advantages and foresaw its almost unlimited possibilities for the toolroom as well as the production line. Thorough redesign gave it new purpose and precision manufacture gave it the accuracy necessary to keep pace with mass-production "musts."

You'd hardly know the old miller now. The spindle is hardened and is equipped with roller or ball-bearings. Solid gibs, box-type saddle and head, counter-balanced motor drive and rapid-action rack and pinion saddle motion have been added...all merged into a compact, multi-purpose machine tool.

Today you can see it performing dozens of different high-speed machining operations on production lines and toolrooms everywhere...*to tolerances in "tenths."*

Your engineering and production problems may be far afield from machine tools, but Nichols' ability and manufacturing facilities may put *new purpose* into one of your reconversion blueprints.

Nichols-built products draw upon the most advanced manufacturing techniques and facilities, including lapping, grinding, hole locating and sizing, plus precision testing methods to affirm their accuracy.

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